THE FORTY-FOURTH YEAR.

Companion to the Almanac;

OR,

YEAR-BOOK

OF

GENERAL INFORMATION

FOR

1871.

PART I.

GENERAL INFORMATION ON SUBJECTS OF MATHEMATICS, NATURAL PHILOSOPHY, GEOGRAPHY, FINE ARTS, POLITICAL ECONOMY, AND HISTORY.

PART II.

ARCHITECTURE AND PUBLIC IMPROVEMENTS, LEGISLATION, STATISTICS, AND CHRONICLE OF 1869–70.

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ON THE MAGNETIC COMPASS.

THE term *magnetism* expresses the peculiar property possessed by certain bodies, more especially by iron and some of its compounds, whereby, under certain circumstances they mutually attract or repel one another, according to determinate laws. This property was first noticed in a mineral substance called the *loadstone* or *natural magnet*, which is a particular ore of iron, of a dark grey hue, and having a dull metallic lustre. It is found in considerable masses in the iron mines of Sweden and Norway, and also in different parts of Arabia, China, and the Philippine Islands. The phenomenon of the attractive power of the loadstone has been, in all ages, a subject of curiosity and wonder.

There are several modes by which a piece of tempered steel may be rendered magnetic, or converted into what is called an *artificial magnet*. For all purposes of accurate experiment, such a magnet is much to be preferred to a loadstone. The following method by Captain Scoresby, is a ready way of obtaining artificial magnets for the purpose of investigating magnetic properties.

Let a straight and symmetrical bar of hard tempered steel, devoid of all perceptible magnetism, be held in a position slightly inclined to the vertical position, with the lower end deviating to the north, and then struck several smart blows with a hammer; it will be found to have acquired, by this simple process, all the properties of a magnet. As the chief properties of a magnet are for the most part generally known, a very brief statement of them will here be sufficient.

If a magnetic bar be supported horizontally in such a manner as to have entire freedom of movement, it will spontaneously turn round and, after a few oscillations, will finally settle in a position directed nearly north and south. If it be disturbed from this situation and placed in any other direction, it will, as soon as it is again at liberty to move, regain its former position. The end of the bar which points towards the north is that which was lowermost at the time it acquired its magnetism by hammering; the end which, during

that operation, had been the upper one, is consequently that which is directed towards the south. The two ends of the magnet are called its *poles*; that which spontaneously turns to the north being distinguished as the *north pole*, and the other as the *south pole*; and the continual tendency of the magnet to assume precisely the same position, is called its *polarity*. The straight line which connects the two poles of a magnet is called its *axis*.

A convenient mode of examining the horizontal movements of the magnetized bar, is to poise it on its centre, hollowed into a cap, which is made to rest on a fine point fixed in a stand. When thus fitted up, it acts like the needle of a mariner's compass; and in its principle is then identical with that instrument.

To experiment as to the mutual relations between two magnets, let the poles of each of them be marked (N. and S.) according to the distinction already described; then it will be found that two north poles always repel each other; that two south poles also repel each other; but that the north pole of one magnet invariably attracts, and is of course attracted by the south pole of another magnet. There are thus two species of magnetic powers, the northern and the southern, which in their mode of action are perfectly similar, but in their effects are directly opposite: between *like* powers there is *repulsion*; between *unlike*, *attraction*.

If an unmagnetized bar of malleable iron be placed in the vicinity of the poles of a magnet, with or without contact, it will immediately become magnetic. The action which thus takes place is called *induction*. It will be found that each pole of the magnet induces the opposite kind of polarity in that end of the iron which is nearest to it. The iron which has thus become magnetic by induction, has at the same time also acquired the power of inducing a similar state of magnetism on other iron in its neighbourhood. It moreover not only acts upon the other iron that is near it, but also reacts upon the magnet from which its power is derived, and increases the intensity of its magnetism.

If the iron bar be perfectly soft and malleable, the magnetism excited by the presence of a natural or artificial magnet will be developed almost instantaneously, but the effect will remain only while the magnet and iron retain their relative situations; for which reason *soft iron* can never be rendered permanently magnetic. But if a bar of steel be made sufficiently hard and then rendered magnetic by induction, it will become permanently magnetic. The cause of this fact is supposed to be that the great cohesive power of the hardened steel resists the recombination of the magnetic fluids after separation, but that with iron in the soft state, the resistance offered by the slight cohesion of the metal is inferior in its power to that with which the fluids have a tendency to combine; and thus it is, that in one case we produce a permanent, and in the other only a temporary, magnetism. For a similar reason, it will be found that a bar of hardened steel requires to remain under the immediate influence of the magnet a certain period of time before the process of induction is fully established. It would indeed appear from the various experiments that have been made, that some definite interval

of time, more or less, is always required to complete the operation of magnetic induction, a fact which particularly distinguishes magnetism from electricity.

The more elementary properties of the magnet, which have already been briefly stated, viz., its power of attraction, capability of transmitting its influence to certain metals by induction, and even its singular determining property as to direction, seem to have been known in Asia and Europe at a period that dates back to the earliest records of history. The first discovery of these distinguishing properties would most decidedly belong to the Chinese if we could only admit the authenticity of their records, the almost incredible antiquity of which is not compatible with the remotest limit of our own received chronology. As regards European nations, the loadstone would appear to have been made practical use of as a directing agent by the Norwegians and Danes, at least half a century before its general adoption by other navigators.

The fixing of the directions north and south, and the division of the visible horizon into four cardinal points, was probably coeval with the primitive and elementary notions respecting the meridian, and therefore with the earliest state of man; though the gradual development into further subdivisions of the horizon for measurements of azimuth, is probably of a comparatively modern date.

In a scientific point of view, observed facts, whatever external and obvious interest they may possess, without a knowledge of the laws by which they are connected together, are of but little import. It must, however, be admitted that purely experimental phenomena, although unexplained by any settled theory, may often, with various degrees of success, be applied to important practical purposes. Still it is evident that no power in nature can be made subservient to all the uses of which it is capable, nor with the same degree of confidence or success, until the rationale of its action has been sufficiently evolved and developed to bring the various results within the range of investigation. The magnet is especially suggestive of such considerations. Its attractive influence upon iron in a soft state, and its attraction and repulsion of the ends of another magnet, under particular conditions, are circumstances of a kind well calculated to excite general curiosity and inquiry; whilst its taking a particular direction when poised upon its centre of gravity, and the peculiar property that all magnets in such case take precisely the same direction in the same locality, were early taken advantage of as a general and reliable guide in traversing distant and unknown regions both on land and sea.

For some centuries after the directive property of the loadstone was known, it was generally supposed that the needle always pointed correctly towards the pole of the heavens. The gradual and steady progress of advancement as regards accuracy of observation during this long interval, eventually proved the inaccuracy of a supposition that would seem to have been universally admitted as true under a specious combination of circumstances. It is not unlikely that in Europe the declination from the meridian at that period was not of sufficient magnitude to arrest the attention of the casual observer or to be easily detected by the instruments then in use; and it may be

principally owing to this circumstance that we have not earlier records of the existence of this variation. Another reason why the variation was not discovered at an earlier period may be that the direction of the needle was at that time tested only by the pole-star, and that the deviation therefrom was tacitly attributed to the known fact that the variable position of the star differed sensibly from that of the true pole. The gradual change in the direction of the needle which has since been observed to take place in successive periods of years, is yet an unexplained phenomenon that makes the compass, important as its aid is in navigation, only partially efficient so long as the laws which regulate that change are undiscovered.

Montucla truly observes in his 'Histoire de Mathématiques,' tom. i., p. 527, that inventions such as that of the mariner's compass proceed step by step with such imperceptible degrees of advancement, that it is very difficult to do justice to the respective claims of different nations; and that it is not surprising, considering the high importance of the compass to navigation, that we should find various claimants to the honour of the discovery. The English are allowed to have been the first who, to preserve its horizontal position, suspended the box by means of two concentric hoops called *gimbals*; but the suspension of the needle by a cap and point, as now universally adopted, is certainly of unknown origin. It appears, however, to be unquestionably established that the mariner's compass in a rude form was at least partially known, besides some of the more obvious magnetic phenomena, before the year 1300. Even the variation is said to be noticed in a Latin letter on the properties of the magnet, dated in the year 1269, and purporting to be by Peter Adsiger. Among the manuscripts of the University of Leyden there is a volume containing several scientific tracts, one of which is the letter referred to; and the following is a translation of the part which mentions the declination of the magnetic needle:

"Take notice, that the magnet, as well as the needle that has been touched by it, does not point exactly to the poles, but that part of it which is reckoned to point to the south declines a little to the west, and that part which looks towards the north inclines as much to the east. The exact quantity of this declination I have found, after numerous experiments, to be five degrees."

Considerable doubt, however, must unavoidably be attached to the authenticity of this letter, since it would seem to be unaccountable that, after such a decided communication, more than two centuries should elapse without any record of a second observation confirmatory of the fact.

The commonly received opinion that it was Columbus who first discovered the declination is also involved in some doubt. The truth, perhaps, is, that the variation of the compass from the true north was known before the date of the voyage of this celebrated navigator, and that he was, in point of fact, the first to discover that the variation was not the same at all places. His son Ferdinand states, that on the 14th of September, 1492, his father first discovered the variation, and that, in consequence, his crew mutinied, supposing that the needle had lost its polarity, and that they would not be able to find

their way back to Europe. The purport of this statement is undoubtedly neither more nor less than that Columbus had discovered the variation to be materially different in different latitudes and longitudes. It may here be noted that the variation, now usually termed the *declination*, is always indicated with reference to the north end of the needle. When the north end of the needle points towards the west of the true meridian the variation, or declination, is said to be west, and when it points to the eastward it is then said to be east.

In the year 1576, Robert Norman, a mathematical instrument maker, London, discovered that besides the known directive power of the needle in azimuth, it had also a certain direction of descending inclination, commonly called the *dip*. He states that, "having made many compasses, and always balanced the needles before he touched them with the magnet, he found continually that, after he had touched them, the north point would incline downward under the horizon, inasmuch that the fly, or card, of the compass, which was before level, he was still constrained to put some small piece of wire on the end thereof to counterpoise it." By actual measurement he found the angle of inclination, or dip, was then about 71° 50′. Soon afterwards, in the year 1580, Borough, the patron of Norman, from observations made at Limehouse, determined the variation at that time to be 11° 15′ east.

About this time the construction of variation charts was contemplated, to facilitate the practice of navigation; and, for that purpose, seamen were urged to keep registers of the variation at as many places as possible; but it was not then supposed that the variation at any given place was subject to any change or, as it might be termed, the variation of the variation. Professor Gellibrand, an English writer on the subject, clearly ascertained this important fact, finding the variation to be only 4° 5′ in 1633; and, by a correction, or adjustment, of Borough's reductions, he determined the former variation, in 1580, to be 11° instead of 11° 15′. Bond, in his 'Longitude Found,' states that the declination was discovered to vary and to decrease, first, by Mr. John Mair, secondly, by Mr. Gunter, thirdly, by Professor Gellibrand, and then by himself in 1640.

A work on magnetism, by Dr. Edmund Halley, was published in 1683, and various papers on the same subject appeared in the 'Abridgment of the Philosophical Transactions,' from vol. ii. to vol. vi. inclusive. Dr. Halley was the first who undertook the construction of a magnetic chart, published in 1791. Since that time different magnetic charts have been published and corrected to particular periods, amongst which we ought to mention one by Yeates in 1817, another, by Professor Barlow, for 1833, and the more recent chart, amplified and corrected to the year 1858, by Frederick J. Evans, master, R.N. Professor Hansteen, of Norway, has also published a very extensive magnetic atlas, containing charts both for the variation and dip. These charts exhibit what are called *isogonic* and *isoclinal* lines.

Isogonic lines are lines traced through all places having the same *declination*, or *variation*.

Isoclinal curves are magnetic parallels of equal inclination, or

equal *dip;* and that particular line upon which the dip is evanescent is the *magnetic equator.*

Isodynamic lines are also sometimes traced through places where the magnetic intensities are equal. These lines resemble the isoclinal curves, but without coinciding with them.

Unfortunately, the continual and irregular changes to which the compass is subject cause magnetic charts containing these lines to be only of a very temporary use. They would be of great ulterior value as a means of determining the movement of the magnetic poles, if the information were accurately indicated. But variation charts can be considered as giving only rough approximations to the true positions of the needle, and then only at dates which are near to the epochs for which the charts were originally constructed.

In the year 1722 another curious fact was discovered in magnetism by Mr. Graham, a celebrated and ingenious philosopher, and mathematical instrument maker, in London. This was, that the needle, besides its annual change in its declination, then gradually carrying it to the westward, is also subject to a daily variation, by which the north end of the needle moves westward during the early part of the day and returns again during the latter part to the bearing it had in the morning. The same author states, 'Abridgment of the Philosophical Transactions,' vol. vii., that from 1000 observations made, for many times each day, and under all variety of circumstances, from February 6th to May 10th, 1772, that the greatest variation westward was found to be 14° 45′, and the least 13° 50′; but that it was seldom more than 14° 35′, or less than 14°. More modern observations show, however, that the limits of the diurnal variation are here stated too widely, as it seldom exceeds 15′; but the account is important as fixing decidedly the date of this discovery, and the amount of the variation in London at that time, which unquestionably must have been between the limits stated.

About the year 1756 Mr. John Canton made extensive observations, with a view not only of discovering the actual amount of this change, but, if possible, of explaining its cause. From these it was found that the daily variation is greater in the summer than in the winter months; and all subsequent observations have tended to establish this fact. According to the mean results deduced by Canton, in the year 1759 and Colonel Beaufoy in 1818, the daily variation in each of the twelve months was as below:

Diurnal Variation of Declination.

Month	Canton 1759		Beaufoy 1818		Month	Canton 1759		Beaufoy 1818	
	′	″	′	″		′	″	′	″
Jan. .	7	8	5	3	July .	13	14	10	43
Feb. .	8	58	6	3	Aug. .	12	19	11	26
Mar. .	11	17	8	22	Sept. .	11	43	9	44
Apr. .	12	26	11	48	Oct. . .	10	36	8	46
May .	13	0	9	53	Nov. .	8	9	7	10
June .	13	21	11	15	Dec. .	6	58	4	7

The greatest deviation on each day was found to take place about two hours after noon, commencing from about seven or eight o'clock in the morning and returning to its morning bearing, or nearly so, about the same hour in the evening. But no approach was made towards the discovery of the causes of these remarkable fluctuations; a satisfactory explanation of which can be attempted only after more extended and complete observations at various stations.

It may here be noticed that the diurnal variation is smallest in December, and that the same fact is presented in numerous observations made in the present century. That the amplitude of the diurnal oscillation should in December have a minimum value, would naturally follow, if the fluctuations have any dependence upon solar influence. Professor Barlow ('Philosophical Transactions' for 1823), made a series of experiments and observations, aided by an ingenious contrivance, whereby the diurnal change was considerably augmented, so as to give a more marked character to the phenomenon.

From the results of these observations, which were confirmed by similar observations made by Professor Christie, he was led to the conclusion that the daily motion was dependent upon the relative position of the sun with respect to the magnetic meridian, and that the proximate cause was to be traced in the altered distribution of temperature. There would seem to be little doubt that the sun is the principal agent in causing these diurnal changes, either by partially heating the surface of the ocean, as suggested by the Astronomer Royal, or, by an electro-magnetic quality in the rays of solar light. Near the equator the diurnal variation is small, probably because the heat of the sun is always nearly of the same intensity.

At a future period, after sufficient observations are made and collected to dispose of other inequalities, some light may be thrown upon the subject by a full discussion of the facts in connexion with the mathematical theory, or by a closer study of the general physical relations that may come under consideration.

Dr. Gilbert was the first to advance the idea that the magnetic action of iron bodies is produced by induction from the *terrestrial magnetism*, and that the laws of terrestrial magnetism are not to be sought amongst those which belong to bodies permanently magnetic, but to those appertaining to bodies passively or temporarily magnetic, as, for example, iron and other ferruginous masses. This hypothesis is admitted and adopted in the modern theories. If the extremity of a bar of soft iron be presented to one of the poles of a magnet, the bar will itself become immediately magnetic during such contact. If a bar of hard iron or steel be similarly placed it will exhibit no sensible amount of magnetism; but if it remain in contact with the magnet for a considerable length of time, it will gradually acquire the same magnetic properties as soft iron, with this difference, however, that having thus acquired the magnetic properties it does not lose them when detached from the magnet, as is the case with soft iron.

Dr. Halley suggested that the magnetism exhibited by the earth was caused "by four poles or points of attraction, two of them near each pole of the equator; and that, in those parts of the world which lie nearly adjacent to any one of those magnetic poles the needle is

equal *dip;* and that particular line upon which the dip is evanescent is the *magnetic equator*.

Isodynamic lines are also sometimes traced through places where the magnetic intensities are equal. These lines resemble the isoclinal curves, but without coinciding with them.

Unfortunately, the continual and irregular changes to which the compass is subject cause magnetic charts containing these lines to be only of a very temporary use. They would be of great ulterior value as a means of determining the movement of the magnetic poles, if the information were accurately indicated. But variation charts can be considered as giving only rough approximations to the true positions of the needle, and then only at dates which are near to the epochs for which the charts were originally constructed.

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governed thereby, the nearest pole being always predominant over that more remote." He also considered that the change in the direction of the needle at the same place was due to a movement of two of these poles about the axis of the earth, the other two being always fixed.

Professor Hansteen, of Norway, in his 'Magnetismus der Erde,' remarks, that as the lines of variation computed on the hypothesis of two magnetic axes, posited at certain distances from the centre of the earth, either represent well the actual phenomena, or assign the limits within which the observations are found to fall; and, as four magnetic poles sufficiently explain the double flexure of the curves of equal dip; and, as the changes of variation and dip are fully explained by supposed movements of the four poles; and as, lastly, the phenomena of the intensity indicate a double magnetic axis, we may consider the hypothesis to be as well established, as a means of representing the phenomena, as any hypothesis whatsoever introduced in physical illustration.

Another important investigation also now became to be undertaken, which was to determine the laws according to which a single insulated particle of magnetic fluid acts on another insulated particle. Coulomb (1786), was the first who established this principle on grounds at all satisfactory. From accurate observations of the relative forces of torsion necessary to make a magnetic bar, horizontally suspended, deviate a given number of degrees from the position assigned to it, he concluded that the attraction and repulsion existing between two magnetic particles is always *inversely as the square of the distance;* agreeing thus with the law observed in electricity, the force of gravity, and every other known force or principle emanating from a centre in right lines. The same law was afterwards further verified and definitely established by Professor Barlow and also by Professor Hansteen.

The study of magnetism was formed into a mathematical science by Æpinus, on the hypothesis of one fluid, the particles of which are mutually repellent. Afterwards, Coulomb, by assuming the existence of two opposite magnetic fluids, placed the theory on a firmer basis. According to Æpinus, iron and all ferruginous matter contain a quantity of magnetic fluid which is equally dispersed through their substance, when those bodies are not magnetic; in which state they show no attraction or repulsion against each other, because the repulsion between the particles of the magnetic fluid is balanced by the attraction between the matters of those bodies and the said fluid; but, when the magnetic fluid is driven to one end, then the body becomes magnetic, one extremity of it being now overcharged with magnetic fluid and the other extremity undercharged. More recent experiments, however, have proved that the displacement which produces the phenomena takes place only in every individual particle; so that each separate particle is in precisely the same state as Æpinus attributes to the whole body. Coulomb made a great step towards perfecting the Æpinian theory of magnetism, by introducing and adopting the hypothesis of two opposite magnetic fluids instead of one, viz., a *boreal fluid* and an *austral fluid*. This supposition was, indeed, inevi-

table, for two north poles and two south poles alike repel each other; which could not take place if either fluid were a mere negation, without at the same time supposing a mutual repulsion to be common to all magnetic matter. He also advanced the collateral hypothesis now generally admitted, that the magnetic body consists of small particles; and that the fluids in their active state are separated in each such particle, but never pass out of it. This may be concluded from the known experiment that if we cut a magnet in pieces, each piece has polarity, a fact which forbids a supposition that the fluids which give magnetic polarity are transferred from one part of iron to another, although these fluids must be separated in each particle to produce the phenomena. The amount of magnetic action which obtains in any case, is to be calculated as the accumulation of the magnetic forces of the several particles, or as the statical resultant of all those forces.

M. Biot (1805), proceeding upon the hypothesis that there were two poles, or points, in a supposed magnetic axis of the earth, by one of which the magnetized needle was attracted and by the other repelled, investigated formulæ for determining the variation and dip, the same being expressed in terms of an arbitrary distance between the poles. By comparing the results obtained by computation from the formulæ with the observed phenomena, he found that the latter were represented for the most part with tolerable accuracy when the poles, or points of attraction and repulsion, were assumed to be infinitely near to each other and to the centre of the earth. This, it will be perceived, of all theories, is the simplest case of terrestrial magnetism. That it could be only approximately true is evident from the consideration that if the two poles were infinitely near to each other, wholly irrespective of other conditions, the opposite effects would be almost neutralized, and the observed magnetic phenomena could not take place on the surface of the earth unless the separate forces of attraction and repulsion were infinitely great.

In 1809, Professor Kraft, of St. Petersburg, from a comparison of experimental results with each other, deduced a very simple and elegant law for the dip, viz., supposing a circle circumscribed about the earth, having the two extremities of the magnetic axis for its poles, and considering it as a magnetic equator, he found that the tangent of the dip of the needle in any magnetic latitude was equal to double the tangent of that latitude. M. Biot afterwards found that his mathematical formula applied to the simplest case of magnetism of a sphere, reduced itself to the same expression; and thus the result was obtained independently and on principles wholly distinct. This law has since been practically verified by our Northern expeditions; and it is now a recognised mathematical principle of terrestrial magnetism. As a result of the simplest case of magnetism, it is of course only approximate, but it is so near to the actual truth as to be of very great practical value, when no other resource is available, especially in determining the situation of the line of the magnetic equator where the dip is zero.

In 1819, Professor Barlow entered upon a series of magnetic experiments, and he found that the attraction of a solid iron sphere was the same as that of a hollow shell, even when the shell was thin;

and a corresponding result was afterwards obtained by Captain Kater in his experiments on sheet iron tubes, the particulars of which were published in the 'Philosophical Transactions' for 1821. From this remarkable property, when first discovered by Barlow, he inferred that the magnetic power of iron resided wholly in the surface, and considered that this result was inconsistent with the theory advanced by Coulomb. But the general and rigorous mathematical investigations of Poisson, soon after established the important conclusion that the equivalence of the assumption of a superficial disposition of magnetism followed as one of the immediate consequences of Coulomb's theory. In 1824, a most able and comprehensive memoir upon the subject, by M. Poisson, was read to the Institute. M. Poisson, by the employment of general analytical methods, obtains mathematical expressions for the attractions and repulsions of a body magnetized by influence upon any point, and discusses at length the particular case in which the body is a sphere. He shows that, in general, the magnetic action of a body of any form whatever is equivalent to that of a thin stratum of magnetic fluid at the surface, although the fluids are separated in every particle of the mass. He gives the name of *magnetic elements* to the small particles of bodies within which the magnetic fluids can be separated.

Up to the present time, it would seem to be not generally known or duly appreciated that about this period a most important work was published at Nottingham, viz., Green's 'Essay on the Application of Mathematical Analysis to the Theories of Electricity and Magnetism.' In this remarkable work the mathematical theory is skilfully developed, a series of general theorems is established, and numerous interesting applications are made to various problems.

The more recent extensions of the general theory, that have any claim to importance, are due to the labours of the able and indefatigable analyst, Professor Gauss, of Göttingen, the results of which, as expounded in his treatise published at Leipzic in 1840, are to be found translated in vol. ii. of 'Taylor's Scientific Memoirs.' Professor Gauss proceeds upon the obvious principle that the terrestrial magnetic force is the collective action of all the magnetized particles of the earth's mass. Magnetization is represented as a separation of the magnetic fluids, and the mode of action of the fluids, repulsion of similar and attraction of dissimilar particles inversely as the square of the distance is regarded as an established truth. No alteration in the results would be caused by changing the mode of representation for that of Ampère, whereby, instead of magnetic fluids, magnetism is held to consist in constant galvanic currents in the minutest particles of bodies. Nor would it occasion any difference if the terrestrial magnetism were ascribed to a mixed origin, as proceeding partly from the separation of the magnetic fluids in the earth, and partly from galvanic currents in the same, inasmuch as it is known that for each galvanic current may be substituted such a given distribution of the magnetic fluids in the surface, bounded by the current, as would exercise in each point of external space precisely the same magnetic action as would be produced by the galvanic current itself. A prominent feature of Professor Gauss's investigations is the fact that he

discusses the subject throughout, independently of all particular hypotheses as to the distribution of the magnetic fluids in the body of the earth. The force which at each part of the earth imparts a certain direction to a magnetic needle suspended by its centre of gravity, is termed *the earth's magnetic force*, in so far as the source whence it is derived is to be sought for within the earth. Whether the seat of the proximate causes of the regular and irregular changes which are hourly taking place in this force may or may not be regarded as external in reference to the earth, it should be remembered that these latter changes are comparatively very small, and that there must therefore exist a much more powerful and constantly acting principal force, of which the seat is assumed to be in the earth itself.

Before drawing to a conclusion, it may interest mathematical readers to have a condensed statement of the theory of terrestrial magnetism as regards the phenomenon caused by the earth's action upon the magnetic compass.

Let μ_1, μ_2, &c., denote portions of magnetic fluid $\begin{pmatrix} + \text{ if northern fluid} \\ - \text{ if southern fluid} \end{pmatrix}$ supposed to be respectively concentrated at certain points (P_1, P_2, &c.) within the earth;

$x_1 y_1 z_1$, $x_2 y_2 z_2$, &c., the coordinates of the points (P_1, P_2, &c.) from which μ_1, μ_2, &c., act; the same being referred to any set of rectangular axes; the radius of the earth being taken as the linear unit;

x y z, the coordinates of a given magnetized point (P), or needle, in space, upon which the united action of μ_1, μ_2, &c., is required to be estimated;

ρ_1, ρ_2, &c., the distances (PP_1, PP_2, &c.) of the given point from the magnetic centres;

X, Y, Z, the total resolved forces acting on the given point, respectively in directions parallel to the coordinate axes.

Each portion of magnetic fluid, while it repels one pole of the needle, will equally attract the opposite pole, and so produce double the mechanical effect; but, as it is only required to estimate the relative values of the several forces, it will be sufficient to consider separately the actions on the north pole only. As positive fluids repel the northern pole of the magnet, it must be assumed that μ_1, μ_2, &c., taken with their proper algebraic signs as defined, act upon P in the directions P_1P, P_2P, &c., and, according to the established law of action, they tend to move the point P in those directions with the forces, $\frac{\mu_1}{\rho_1^2}$, $\frac{\mu_2}{\rho_2^2}$, &c. By the geometrical relations, the united component forces, in directions parallel to the coordinate axes, are

$$\left.\begin{aligned} X &= \mu_1 \frac{x - x_1}{\rho_1^3} + \mu_2 \frac{x - x_2}{\rho_2^3} + \ldots . \\ Y &= \mu_1 \frac{y - y_1}{\rho_1^3} + \mu_2 \frac{y - y_2}{\rho_2^3} + \ldots . \\ Z &= \mu_1 \frac{z - z_1}{\rho_1^3} + \mu_2 \frac{z - z_2}{\rho_2^3} + \ldots . \end{aligned}\right\} \ldots . (1)$$

$$\text{Also,} \quad \rho_1 = \sqrt{\{(x-x_1)^2 + (y-y_1)^2 + (z-z_1)^2\}}$$
$$\rho_2 = \sqrt{\{(x-x_2)^2 + (y-y_2)^2 + (z-z_2)^2\}}$$
$$\text{\&c.} \qquad\qquad \text{\&c.}$$

$$\text{Let} \quad V = -\left(\frac{\mu_1}{\rho_1} + \frac{\mu_2}{\rho_2} + \ldots.\right) = -\Sigma\frac{\mu_1}{\rho_1} \ldots (2),$$

a function of x, y, z, or of any three variable magnitudes, whereby the positions of points in space may be defined. Then the values of the component forces expressed in (1) are manifestly the partial differential coefficients of V relatively to x, y, z; that is,

$$X = \frac{dV}{dx}, \; Y = \frac{dV}{dy}, \; Z = \frac{dV}{dz} \ldots . (3)$$

Moreover, as the positions of the coordinate axes are arbitrary, any one of them might have been taken so as to coincide with ds, the distance to any consecutive point where V becomes $V + dV$, and it immediately follows that $\frac{dV}{ds}$ expresses the force resolved in any direction ds.

This general and elegant property gives an important significance to the function V, and an excellent graphical conception of the theory is at once obtained by a simple consideration of its varying magnitude. Those points of space at which the value of V exceeds a given value V_0, are partitioned from those at which it is less than V_0 by a curved surface in all the points of which V has the given value V_0. According to (3), at each point of this surface the magnetic force is directed along the normal to the surface, and towards the side where the higher values of V are found. The points for which V takes a consecutive value, $V_0 + dV_0$, lie in a second surface, indefinitely near to the first, and at different points in the intervening space the intensity of the magnetic force is in the inverse ratio of the distance apart of the two surfaces. And if the function V be supposed to alter by infinitely small but equal gradations, a system of surfaces will be produced, dividing space into infinitely thin strata; and then at each and every point of space the magnetic force will be inversely as the thickness of the stratum in which it is situated.

The only requisition necessary to a complete localised knowledge of all the resulting forces acting upon the pole of the needle, or upon the point P in space, is to express the value of the function V in terms of such variables as may conveniently indicate the geographical positions of the several points.

Let r denote the distance (OP) of the given point from the centre of the earth; and, referring the points to the surface of a sphere concentric with the earth, let λ, u denote the longitude and north-polar distance of P, the longitude being $\frac{+\text{ east}}{-\text{ west}}$. Also, let $r_1\lambda_1u_1$, $r_2\lambda_2u_2$, &c., have the same signification with respect to the magnetic centres, P_1, P_2, &c.; and let a_1, a_2, &c., denote the angular distances POP_1, POP_2, &c. We have then the trigonometrical relations,

$$\cos a_1 = \cos u_1 \cos u + \sin u_1 \sin u \cos(\lambda - \lambda_1) \ldots (4)$$
$$\rho_1^2 = r^2 - 2r_1 r \cos a + r_1^2 \ldots\ldots (5)$$

with analogous relations for the other centres.

From (2) and (5)

$$V = \frac{1}{r} \Sigma \left\{ \mu_1 \left(1 - \frac{2r_1}{r} \cos a + \frac{r_1^2}{r^2} \right)^{-\frac{1}{2}} \right\} \ldots (6)$$

Let this expression, when expanded in powers of the fraction $\frac{r_1}{r}$, as far as the fourth, be thus denoted, viz.,

$$V = -\left(\frac{P}{r^2} + \frac{Q}{r^3} + \frac{R}{r^4} + \frac{S}{r^5} \ldots \right) \ldots . (7)$$

observing that the first term $\frac{1}{r}\Sigma\mu_1$ has already disappeared, it being presumed that equal amounts of positive and negative magnetic fluid are developed in the earth, and that, therefore, $\Sigma\mu_1 = 0$.

By performing the algebraic evolution indicated in (6), it is hence found that

$$\begin{aligned}
P &= \Sigma (\mu_1 r_1 \cos a_1) \\
Q &= -\Sigma \left(\mu_1 r_1^2 \frac{1 - 3\cos^2 a_1}{2} \right) \\
R &= -\Sigma \left(\mu_1 r_1^3 \frac{3\cos a_1 - 5\cos^3 a_1}{2} \right) \\
S &= \Sigma \left(\mu_1 r_1^4 \frac{3 - 30\cos^2 a_1 + 35\cos^4 a_1}{8} \right) \ldots (8)
\end{aligned}$$

Again, by substituting the value of $\cos a_1$, according to (4), and replacing the powers of $\cos(\lambda - \lambda_1)$ by their equivalents in cosines of the multiple arcs, the following results are obtained:

$$P = g_{1,0} \cos u + (g_{1,1} \cos\lambda + h_{1,1} \sin\lambda) \sin u$$

$$\begin{aligned}
Q = g_{2,0} &\left(\cos^2 u - \frac{1}{3} \right) + (g_{2,1} \cos\lambda + h_{2,1} \sin\lambda) \cos u \sin u \\
&+ (g_{2,2} \cos 2\lambda + h_{2,2} \sin 2\lambda) \sin^2 u
\end{aligned}$$

$$\begin{aligned}
R = g_{3,0} &\left(\cos^3 u - \frac{3}{5} \cos u \right) \\
&+ (g_{3,1} \cos\lambda + h_{3,1} \sin\lambda) \left(\cos^2 u - \frac{1}{5} \right) \sin u \\
&+ (g_{3,2} \cos 2\lambda + h_{3,2} \sin 2\lambda) \cos u \sin^2 u \\
&+ (g_{3,3} \cos 3\lambda + h_{3,3} \sin 3\lambda) \sin^3 u
\end{aligned}$$

$$\begin{aligned}
S = g_{4,0} &\left(\cos^4 u - \frac{6}{7} \cos^2 u + \frac{3}{35} \right) \\
&+ (g_{4,1} \cos\lambda + h_{4,1} \sin\lambda) \left(\cos^3 u - \frac{3}{7} \cos u \right) \sin u \\
&+ (g_{4,2} \cos 2\lambda + h_{4,2} \sin 2\lambda) \left(\cos^2 u - \frac{1}{7} \right) \sin^2 u \\
&+ (g_{4,3} \cos 3\lambda + h_{4,3} \sin 3\lambda) \cos u \sin^3 u \\
&+ (g_{4,4} \cos 4\lambda + h_{4,4} \sin 4\lambda) \sin^4 u \ldots . (9)
\end{aligned}$$

in which the several coefficients, here more distinctly represented by the letters g and h, have the following values:

$$g_{1,0} = \Sigma(\mu_1 r_1 \cos u_1)$$

$$\begin{cases} g_{1,1} = \Sigma\,(\mu_1 r_1 \sin u_1 \cos \lambda_1) \\ h_{1,1} = \Sigma\,(\mu_1 r_1 \sin u_1 \sin \lambda_1) \end{cases}$$

$$g_{2,0} = -\frac{3}{4}\Sigma\{\,\mu_1 r_1^2\,(1 - 3\cos^2 u)\}$$

$$\begin{cases} g_{2,1} = 3\,\Sigma\,(\mu_1 r_1^2 \cos u_1 \sin u_1 \cos \lambda_1) \\ h_{2,1} = 3\,\Sigma\,(\mu_1 r_1^2 \cos u_1 \sin u_1 \sin \lambda_1) \end{cases}$$

$$\begin{cases} g_{2,2} = \frac{3}{4}\,\Sigma\,(\mu_1 r_1^2 \sin^2 u_1 \cos 2\,\lambda_1) \\ h_{2,2} = \frac{3}{4}\,\Sigma\,(\mu_1 r_1^2 \sin^2 u_1 \sin 2\,\lambda_1) \end{cases}$$

$$g_{3,0} = -\frac{5}{4}\Sigma\,\{\,\mu_1 r_1^3\,(3\cos u_1 - 5\cos^3 u_1)\}$$

$$\begin{cases} g_{3,1} = -\frac{15}{8}\Sigma\{\mu_1 r_1^3\,(1 - 5\cos^2 u_1)\sin u_1 \cos \lambda_1\} \\ h_{3,1} = -\frac{15}{8}\Sigma\,\{\mu_1 r_1^3\,(1 - 5\cos^2 u_1)\sin u_1 \sin\,\lambda\} \end{cases}$$

$$\begin{cases} g_{3,2} = \frac{15}{4}\Sigma\,(\mu_1 r_1^3 \cos u_1 \sin^2 u_1 \cos 2\,\lambda_1) \\ h_{3,2} = \frac{15}{4}\Sigma\,(\mu_1 r_1^3 \cos u_1 \sin^2 u_1 \sin 2\,\lambda_1) \end{cases}$$

$$\begin{cases} g_{3,3} = \frac{5}{8}\Sigma\,(\mu_1 r_1^3 \sin^3 u_1 \cos 3\,\lambda_1) \\ h_{3,3} = \frac{5}{8}\Sigma\,(\mu_1 r_1^3 \sin^3 u_1 \sin 3\,\lambda_1) \end{cases}$$

$$g_{4,0} = \frac{35}{64}\Sigma\,\{\,\mu_1 r_1^4\,(3 - 30\cos^2 u_1 + 35\cos^4 u_1)\,\}$$

$$\begin{cases} g_{4,1} = -\frac{35}{8}\Sigma\,\{\mu_1 r_1^4\,(3\cos u_1 - 7\cos^3 u_1)\sin u_1 \cos \lambda_1\} \\ h_{4,1} = -\frac{35}{8}\Sigma\,\{\mu_1 r_1^4\,(3\cos u_1 - 7\cos^3 u_1)\sin u_1 \sin \lambda_1\} \end{cases}$$

$$\begin{cases} g_{4,2} = -\frac{35}{16}\Sigma\,\{\mu_1 r_1^4\,(1 - 7\cos^2 u_1)\,\sin^2 u_1 \cos 2\,\lambda_1\} \\ h_{4,2} = -\frac{35}{16}\Sigma\,\{\mu_1 r_1^4\,(1 - 7\cos^2 u_1)\sin^2 u_1 \sin 2\,\lambda_1\} \end{cases}$$

$$\begin{cases} g_{4,3} = \frac{35}{8}\Sigma\,(\mu_1 r_1^4 \cos u_1 \sin^3 u_1 \cos 3\,\lambda_1) \\ h_{4,3} = \frac{35}{8}\Sigma\,(\mu_1 r_1^4 \cos u_1 \sin^3 u_1 \sin 3\,\lambda_1) \end{cases}$$

$$\begin{cases} g_{4,4} = \frac{35}{64}\Sigma\,(\mu_1 r_1^4 \sin^4 u_1 \cos 4\,\lambda_1) \\ h_{4,4} = \frac{35}{64}\Sigma\,(\mu_1 r_1^4 \sin^4 u_1 \sin 4\,\lambda_1) \end{cases} \quad \ldots\,(10)$$

The values of these twenty-four coefficients, it will be perceived, are dependent exclusively upon the particular distribution of the magnetic fluids within the earth.

In the formulæ (1) and (3) the positions of the rectangular co-ordinate axes are quite arbitrary. For defining the positions of the magnetic needle at a point, P, near the surface of the earth, it will be convenient to fix them thus, viz., x horizontal along the geographical meridian, $\begin{matrix}+\text{ north}\\-\text{ south}\end{matrix}$; y horizontal, $\begin{matrix}+\text{ west}\\-\text{ east}\end{matrix}$; z vertical $\begin{matrix}+\text{ downwards}\\-\text{ upwards}\end{matrix}$. We shall then have $dx = -r\,du$, $dy = -r\,d\lambda \sin u$, $dz = -dr$; so that the resolved magnetic forces in the directions *north*, *west*, and *vertically downwards*, are respectively

$$X = -\frac{dV}{r\,du},\ Y = -\frac{dV}{r\,d\lambda \sin u},\ Z = -\frac{dV}{dr} \quad \ldots\ (11)$$

Hence, substituting for V the form of development (7), and finally making $r =$ *unity* (the earth's radius), we obtain

$$\left.\begin{aligned} X &= \frac{d}{du}(P + Q + R + S \ldots.) \\ Y &= \frac{1}{\sin u}\frac{d}{d\lambda}(P + Q + R + S \ldots.) \\ Z &= 2P + 3Q + 4R + 5S \ldots. \end{aligned}\right\} \quad \ldots.\ (12)$$

and as P, Q, R, S, are, in (9), already expressed as known functions of u and λ, the sought values of X, Y, Z, in terms of the same quantities, may be immediately written out. The deductions, although somewhat lengthy, are so simple and evident that it is unnecessary to give the results.

Now, if γ denote the *total intensity* of the magnetic force which acts on the needle in the direction of its length; h the *horizontal force* in a like direction; δ the *declination* from the true north, $\begin{matrix}+\text{ west}\\-\text{ east}\end{matrix}$; and i the angle of depression, or *dip*; these *elements of the needle* are obtained from the obvious statical relations,

$$\left.\begin{aligned} X &= h\cos\delta \\ Y &= h\sin\delta \end{aligned}\right\} \qquad \left.\begin{aligned} h &= \gamma\cos i \\ Z &= \gamma\sin i \end{aligned}\right\}$$

the formula of calculation being—

$$\tan\delta = \frac{Y}{X},\ h = \frac{X}{\cos\delta};\ \tan i = \frac{Z}{h},\ \gamma = \frac{h}{\cos i} \quad \ldots.\ (13)$$

It will be observed, that the foregoing investigation is wholly unrestricted as to the number of magnetic centres. If the magnetic actions are to be estimated with reference to every separate particle of the earth's mass, so that the arbitrary distribution of the magnetic fluids may be quite absolute, it will only be requisite to replace μ by $d\mu$ and Σ by $\int$. This generalization, however, produces no change whatever in the forms of the developments, and therefore does not affect any calculation or result; the only alteration being as to the apparent nomenclature in the analytical statement of the coefficients

in (10). The numerical values of these twenty-four coefficients are to be obtained from at least an equal number of observations in various geographical positions. The reduction of the equations of condition, involving as many as twenty-four unknown quantities, is necessarily very laborious.

The values of the coefficients for 1829, as first found by Professor Gauss, and the same as afterwards more approximately computed under the direction of Professor Erman, on behalf of the British Association, are stated in the following table:

Gaussian Coefficients (1829).

	Gauss	Erman *		Gauss	Erman *
$g_{1,0}$ =	+925·782	+844·882			
$g_{1,1}$ =	+ 89·024	+ 34·394	$h_{1,1}$ =	−178·744	−168·416
$g_{2,0}$ =	− 22·059	+103·893			
$g_{2,1}$ =	−144·913	− 0·263	$h_{2,1}$ =	− 6·030	− 99·631
$g_{2,2}$ =	+ 0·493	− 10·501	$h_{2,2}$ =	− 39·010	− 87·412
$g_{3,0}$ =	− 18·868	− 70·457			
$g_{3,1}$ =	+122·936	− 27·333	$h_{3,1}$ =	+ 47·794	+230·407
$g_{3,2}$ =	− 73·193	− 9·067	$h_{3,2}$ =	− 22·766	+121·751
$g_{3,3}$ =	+ 1·396	+ 38·950	$h_{3,3}$ =	− 18·750	− 40·139
$g_{4,0}$ =	−108·855	−175·913			
$g_{4,1}$ =	−152·589	−142·720	$h_{4,1}$ =	+ 64·112	− 94·922
$g_{4,2}$ =	− 45·791	−176·064	$h_{4,2}$ =	+ 42·573	− 90·889
$g_{4,3}$ =	+ 19·774	− 44·861	$h_{4,3}$ =	− 0·178	+ 36·324
$g_{4,4}$ =	+ 4·127	+ 9·248	$h_{4,4}$ =	+ 3·175	+ 19·156

Professor Gauss designates these numbers, "the elements of the theory of terrestrial magnetism;" and they have been called "Gaussian Constants." But, unfortunately, they are constant as to locality only, and not chronologically as to time. Moreover, it may fairly be objected that these coefficients exhibit but little sign of convergency; that, indeed, there can be no certainty as to the convergency of the development of the function V in powers of $\frac{r_1}{r}$, &c., unless there were evidence to show that the sources of magnetic action were exclusively deep-seated, and restricted to positions near the centre of the earth, a condition that does not appear to be borne out by the practical details of the investigation. There is, on the other hand, good reason to suppose that the assumption of a limited number of centres of magnetism, and the employment of the formulæ (1) to (6), without having recourse to any objectionable development by series, would yield more accurate and less exceptional results, and convey some tangible indication of magnetic changes within the earth. The hypothesis of two or more centres would, at the same time, have a satisfactory physical basis on its being understood that these centres are to be regarded only as equivalent concentrations of immediately surrounding magnetic influences.

* From 610 magnetic elements observed in the years 1828 to 1830.

All that has yet been accomplished in the theory of the magnetic needle is limited to the object of connecting together a number of cotemporaneous observations at various stations, under a consistent combination of proximate causes, for the purpose of deducing a complete and systematised knowledge of coexisting phenomena in all localities. In furtherance of this object, and for ulterior purposes, numerous magnetic observatories have for some years past been in active operation; magnetism has taken its place by the side of astronomy, and accurate observations of the *declination*, *dip*, and *intensity* are now recorded daily and hourly. But no satisfactory step has yet been made towards an explanation of the causes of the mysterious changes that are incessantly taking place in all three elements; and it will be necessary to accumulate such observations for a long course of years before the various periodical inequalities can be properly and successfully subjected to investigation.

The comparisons of numerous pre-organized cotemporary observations in different localities have established the very remarkable fact, that the successive changes in the magnetic elements throughout each day are practically simultaneous at stations as much as 500 or 600 miles distant; and that these changes, at stations within such distances, follow the same laws, the curves which graphically represent them being so similar to one another in all their fantastic inflexions, as to be almost identical. The irregularities are far from being obliterated when mean values of the elements are taken for consecutive months. A specimen of the apparent irregularities of these mean magnetic changes is presented in the following table, extracted from the observations made at the Royal Observatory, at Greenwich, containing the mean western declination of the magnet in each month, and the mean for each year; showing, also, the monthly and annual progress of secular variation.

Mean Westerly Declination of the Magnet at Greenwich.

Month	1858	1859	1860	1861	1862	1863	Mean (1858-63)	Corrected for Secular Change, viz.:—9·2′
	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′
Jan.	21 33·9	21 26·7	21 15·0	21 10·6	20 58·8	20 49·9	21 12·5	21 12·5
Feb.	21 33·4	21 27·1	21 13·8	21 9·9	20 58·4	20 48·4	21 11·8	21 12·6
Mar.	21 33·5	21 27·4	21 14·1	21 14·0	20 57·8	20 48·1	21 12·5	21 14·0
Apr.	21 33·3	21 26·4	21 14·7	21 8·2	20 50·4	20 46·5	21 9·9	21 12·2
May	21 30·1	21 22·3	21 17·2	21 5·1	20 49·7	20 45·7	21 8·4	21 11·5
June	21 29·2	21 24·3	21 15·5	21 1·5	20 52·5	20 46·2	21 8·2	21 12·0
July	21 28·5	21 24·5	21 15·5	21 5·3	20 50·4	20 46·7	21 8·5	21 13·1
Aug.	21 28·5	21 22·7	21 14·9	21 5·1	20 52·3	20 46·0	21 8·2	21 13·6
Sept.	21 27·6	21 22·3	21 12·9	21 2·5	20 51·1	20 44·8	21 6·9	21 13·0
Oct.	21 26·4	21 20·0	21 13·5	21 1·7	20 50·4	20 43·7	21 6·0	21 12·9
Nov.	21 30·1	21 19·5	21 12·2	21 1·5	20 49·9	20 42·7	21 6·0	21 13·7
Dec.	21 29·3	21 18·8	21 11·9	21 0·8	20 50·0	20 42·0	21 5·5	21 13·9
Mean	21 30·3	21 23·5	21 14·3	21 5·5	20 52·6	20 45·9	..	..

The corresponding mean diurnal changes of the declination are also here annexed.

Mean Diurnal Changes of Declination at Greenwich.

Month	1858	1859	1860	1861	1862	1863	Mean for whole period
	′	′	′	′	′	′	′
Jan. .	8·1	8·9	8·9	10·1	11·0	13 6	10·0
Feb. .	10·6	11·4	10·4	12·6	9·8	12·4	11·2
Mar. .	12·8	15·8	16·5	15·8	11·7	14·7	14·5
Apr. .	14·1	17·2	15·3	16·4	13·4	14·9	15·2
May .	12·4	17·0	14·3	13·4	13·3	13·1	13·9
June .	11·9	14·8	15·9	13·8	14·1	12·1	14·1
July .	13·2	13·4	16·2	12·4	11·2	12·3	13·1
Aug. .	12·7	15·8	16·3	16·8	12·1	13·1	14·5
Sept. .	15·9	17·3	15·5	13·3	12 3	15·5	15·0
Oct. .	15·2	15·F	13·2	12·3	13·6	13·5	13·8
Nov. .	9·3	9·8	10·8	10·0	10·7	12·1	10·5
Dec. .	9·7	8·3	10·0	10·6	11·3	11·4	10·2
Mean	12·2	13·7	13·6	13·1	12·0	13·2	13·0

The results exhibited in these tables were obtained from a system of photographic self-registration, and they are the means of values for every hour determined by measurement from the photographic sheets.

For the years subsequent to 1863 the photographic values are not completely reduced. But the 'Greenwich Observations' give mean values of the magnetic declination that have been deduced from a few observations made daily, and originally taken for the purpose of fixing the zero line on the photographic sheets. The mean values so derived will in general be found to differ from the means obtained from hourly values by only a very small fraction of a minute. In the following table they are given up to the end of the year 1869. The mean values contained in this table include observations made *on every day of the year*. In the computation of those stated for 1858 to 1863, in the previous table, the observed results on a few days, during the year, on which the magnet *was very violently disturbed* (that is, a few days of great magnetic storms) were carefully excluded.

Mean Westerly Magnetic Declination for Greenwich.

Month.	1863	1864	1865	1866	1867	1868	1869
	° ′		° ′	° ′	° ′	° ′	° ′
January .	20 50·1	The magnetic instruments were dismounted during 1864 for the construction of an underground apartment for their reception in which the changes of temperature are very small.	..	20 33·1	20 22·0	20 15·1	20 9·2
February	20 48·5		20 31·1	20 32·9	20 21·3	20 14·8	20 8·5
March .	20 48·6		20 32·4	20 31·7	20 23·4	20 15·4	20 8·2
April .	20 46·8		20 34·0	20 32·2	20 23·1	20 15·9	20 6·9
May . .	20 45·6		20 33·9	20 30·6	20 22·0	20 15·3	20 6·5
June . .	20 46·2		20 30·6	20 28·8	20 20·4	20 13·4	20 4·9
July . .	20 46·5		20 31·5	20 26·3	20 19·9	20 12·8	20 4·4
August .	20 45·7		20 33·0	20 25·2	20 19·6	20 12·9	20 3·7
September	20 45·1		20 33·0	20 23·7	20 19·0	20 13·3	20 1·8
October .	20 43·6		20 34·2	20 23·6	20 18·8	20 10·9	20 0·6
November	20 42·2		20 32·9	20 22·9	20 17·8	20 9·8	19 59·5
December	20 42·0		20 33·3	20 22·4	20 16·0	20 9·3	19 58·6
Mean .	20 45·9	..	20 32·7	20 27·8	20 20·3	20 13·2	20 4·4

The mean for 1865, it will be perceived, is for 11 months only.

To these I have only to append the following table of declinations as observed at several stations, extracted from Colonel Sabine's valuable report to the British Association on the 'Magnetic Survey of Great Britain.'

Mean Declination of the Magnet at different Stations.

Place	Latitude	Longitude	Date	Declination δ	Observer
	° ′	° ′		° ′	
Dublin . .	53 21 N	6 16 W	1 Jan. 1857	25 45·0 W	Rev. J. Galbraith, M.A.
Falmouth .	50 11	5 1	„ „	24 1·0	Captain G. Williams, R.N.
Grimsby . .	53 34	0 5	„ „	22 29·5	Rear-Admiral Sir J. C. Ross.
Liverpool .	53 25	3 1	„ „	23 55·5	Mr. W. W. Rundell.
Plymouth .	50 21	4 9	„ „	23 24·5	Commodore H. L. Cox, R.N.
Scilly Islands	49 58	6 18	„ „	24 8·0	Captain G. Williams, R.N.
Kew . . .	51 28	0 19	1 Jan. 1858	21 56·1	Balfour Stewart, M.A.
Edinburgh .	55 58	3 11	„ „	24 56·2	
Glasgow . .	55 52	4 16	„ „	25 27·9	
Inverness .	57 28	4 11	„ „	25 58·7	

According to this table, I find that for any place in Great Britain, the north latitude of which is 50° + L, and west longitude is M (L and M being expressed in *minutes of arc*), the mean western declination of the magnet on the 1st of January, 1870, may be obtained approximately from the formula,

$$\delta = 19° 26{\cdot}2' + {\cdot}38\ \mathrm{L} + {\cdot}53\ \mathrm{M}.$$

In the foregoing pages I have presented a condensed account of the principal facts connected with the history of the magnet and of the state of our present information respecting the physical and mathematical theories of magnetism. The mysterious phenomena of terrestrial magnetism have acquired a most prominent position as a subject of minute inquiry and investigation, and extensive and accurate observations of the magnetic elements are now continually made at numerous stations. These accumulating observations are prosecuted methodically and with commendable ardour, owing to the rapidly increasing interest of the subject, which is further enhanced by a knowledge of the important and indispensable use of the magnetic compass as a trustworthy guide in navigation. With the aid of the compass the mariner, however distant from land, amidst cloudy skies and in the darkest nights, is enabled at all times to direct his course with certainty, and traverse in all directions the wide expanses of ocean which separate the countries and continents of our globe, in furtherance of the universal requirements of commerce and civilization.

W. S. B. Woolhouse.

TABLES USED IN COMPUTING THE HEIGHTS OF HIGH WATER AT THE LONDON DOCKS.

The following tables, for determining the Heights of High Water at the London Docks, have been deduced from those given in 'An Elementary Treatise on the Tides.' By J. W. Lubbock, Esq. (London, 1839.) The tables for the *times* of high water, contained in the same work, have, since its publication, been uniformly adopted in the computations made for the 'Nautical Almanac.' There can be no doubt that Mr. Lubbock's valuable treatise, now out of print, presented the best set of Tide Tables that have been published for the Port of London; and that great practical benefit has been derived from the use of these tables for the last thirty years. In the tables for the *heights*, here given, some requisite and convenient adaptations have been introduced, of which a brief explanation will be necessary.

According to Mr. Lubbock's table of the "semi-menstrual inequality," the heights are supposed to be measured from the sill of the gates of the Wapping entrance. Table I. has been derived from Mr. Lubbock's Table VI., by incorporating the following corrections, viz.:

− 2·75 feet	to adjust the zero-point and to obtain the height above the mean level of low water ordinary spring tides, in accordance with the results usually given in the 'British Almanac.'	
− 1·89 „	for constants added to the other Tables, viz.:—Table II.	+ 0·88
	„ III.	·76
	„ IV.	·25
		1·89
+ 0·33 „	to 0·66 for arbitrary corrections for increased elevation of tide due to the recent removal of obstructions in the river.	
Total . − 3·98 „	to − 4·31	

TABLE I.

Semi-menstrual Inequality.

Moon's Transit	½ Height	Diff.	Moon's Transit	Moon's Transit	Height	Diff.	Moon's Transit
h m	ft.		h m	h m	ft.		h m
0 0	18·68	0	12 0	3 0	17·42	13	9 0
10	18·68	1	11 50	10	17·29	14	8 50
20	18·67	2	40	20	17·15	14	40
30	18·65	2	30	30	17·01	15	30
40	18·63	2	20	40	16·86	16	20
50	18·61	3	10	50	16·70	17	10
1 0	18·58	4	11 0	4 0	16·53	16	8 0
10	18·54	5	10 50	10	16·37	16	7 50
20	18·49	7	40	20	16·21	15	40
30	18·42	8	30	30	16·06	15	30
40	18·34	9	20	40	15·91	14	20
50	18·25	11	10	50	15·77	13	10
2 0	18·14	11	10 0	5 0	15·64	12	7 0
10	18·03	11	9 50	10	15·52	11	6 50
20	17·92	12	40	20	15·41	9	40
30	17·80	12	30	30	15·32	5	30
40	17·68	13	20	40	15·27	2	20
50	17·55	13	10	50	15·25	0	10
3 0	17·42		9 0	6 0	15·25		6 0

In the Tables II. and III., containing the corrections for the Moon's Parallax and Declination, the mean values have been given, irrespective of the hours of transit; which greatly simplifies the calculation without involving any appreciable variation in the result. These tables also include the respective additions before mentioned, in order to make all the values positive.

TABLE II.

Correction for Moon's Parallax.

Moon's Hor. Par.	Corr.	Moon's Hor. Par.	Corr.	Moon's Hor. Par.	Corr.
′	ft.	′	ft.	′	ft.
52·8	0·00	55·8	0·62	58·8	1·30
·9	·02	·9	·64	·9	1·33
53·0	·04	56·0	·66	59·0	1·35
·1	·06	·1	·68	·1	1·38
·2	·08	·2	·70	·2	1·40
·3	·10	·3	·73	·3	1·42
·4	·12	·4	·75	·4	1·45
·5	·14	·5	·77	·5	1·48
·6	·16	·6	·79	·6	1·50
·7	·18	·7	·81	·7	1·52
·8	·20	·8	·84	·8	1·55
·9	·22	·9	·86	·9	1·58
54·0	·24	57·0	·88	60·0	1·60
·1	·26	·1	·90	·1	1·62
·2	·28	·2	·93	·2	1·65
·3	·30	·3	·95	·3	1·68
·4	·32	·4	·97	·4	1·70
·5	·34	·5	·99	·5	1·72
·6	·36	·6	1·02	·6	1·75
·7	·38	·7	1·04	·7	1·78
·8	·40	·8	1·06	·8	1·80
·9	·42	·9	1·09	·9	1·82
55·0	·44	58·0	1·11	61·0	1·85
·1	·46	·1	1·13	·1	1·87
·2	·48	·2	1·16	·2	1·90
·3	·51	·3	1·18	·3	1·92
·4	·53	·4	1·21	·4	1·95
·5	·55	·5	1·23	61·5	1·98
·6	·57	·6	1·25		
55·7	0·59	58·7	1·28		

TABLE III.

Correction for Moon's Declination.

Moon's Decl.	Corr.
°	ft.
0	1·07
1	1·07
2	1·06
3	1·06
4	1·05
5	1·04
6	1·02
7	1·00
8	0·98
9	·96
10	·93
11	·90
12	·87
13	·84
14	·80
15	·76
16	·72
17	·68
18	·63
19	·58
20	·53
21	·48
22	·43
23	·37
24	·31
25	·25
26	·19
27	·13
28	·07
29	0·00

Table IV. exhibits, in one table, a combination of Mr. Lubbock's separate tabular corrections for the Sun's Declination and Parallax. It is conveniently made to depend upon the day of the month; and 0·25 has been added, so that the numbers may be made positive throughout, and all considerations of algebraic sign may be thus obviated.

In using the tables it will be understood that the moon's transit should be stated in *apparent* time. It is also important to note that the computed height must always be regarded as appertaining to the high water that immediately follows the transit of the moon that takes place two days later than the transit, and other data, used in the calculation.

Example.—Required the height of the high water at the London Docks, which depends upon the transit of the moon on June 21, 1871.

TABLE IV.

Calendar Correction for Date.

Date	Moon's Transit, B.											
	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.	ft.
Jan. 1	·18	·18	·19	·20	·24	·28	·30	·30	·28	·24	·20	·19
„ 11	·21	·21	·21	·22	·25	·27	·28	·28	·27	·25	·23	·21
„ 21	·25	·25	·24	·24	·25	·25	·25	·25	·25	·25	·24	·24
„ 31	·29	·29	·27	·27	·24	·23	·22	·22	·23	·25	·27	·27
Feb. 10	·32	·32	·30	·28	·26	·22	·19	·19	·22	·26	·28	·30
„ 20	·36	·36	·34	·31	·26	·19	·15	·15	·19	·26	·31	·34
Mar. 2	·39	·39	·35	·32	·27	·18	·12	·12	·18	·27	·32	·35
„ 12	·39	·39	·36	·32	·27	·18	·12	·12	·18	·27	·32	·36
„ 22	·40	·40	·37	·33	·27	·18	·11	·11	·18	·27	·33	·37
Apr. 1	·35	·35	·33	·30	·26	·20	·15	·15	·20	·26	·30	·33
„ 11	·30	·30	·29	·28	·25	·22	·20	·20	·22	·25	·28	·29
„ 21	·26	·26	·27	·26	·24	·24	·24	·24	·24	·24	·26	·27
May 1	·21	·21	·22	·23	·24	·27	·29	·29	·27	·24	·23	·22
„ 11	·15	·15	·16	·19	·23	·30	·35	·35	·30	·23	·19	·16
„ 21	·11	·11	·12	·17	·23	·31	·39	·39	·31	·23	·17	·12
„ 31	·06	·06	·08	·15	·23	·33	·43	·43	·33	·23	·15	·08
June 10	·01	·01	·05	·12	·22	·35	·45	·45	·35	·22	·12	·05
„ 20	·00	·00	·04	·12	·22	·35	·46	·46	·35	·22	·12	·04
„ 30	·01	·01	·04	·12	·22	·35	·46	·46	·35	·22	·12	·04
July 10	·03	·03	·06	·13	·23	·34	·44	·44	·34	·23	·13	·06
„ 20	·07	·07	·09	·15	·23	·33	·41	·41	·33	·23	·15	·09
„ 30	·12	·12	·13	·18	·23	·31	·37	·37	·37	·23	·18	·13
Aug. 9	·18	·18	·19	·21	·24	·28	·32	·32	·28	·24	·21	·19
„ 19	·23	·23	·24	·24	·24	·25	·27	·27	·25	·24	·24	·24
„ 29	·29	·29	·28	·27	·25	·23	·22	·22	·23	·25	·27	·28
Sept. 8	·32	·32	·31	·29	·25	·21	·18	·18	·21	·25	·29	·31
„ 18	·33	·33	·32	·30	·25	·20	·18	·18	·20	·25	·30	·32
„ 28	·36	·36	·34	·31	·26	·19	·15	·15	·19	·26	·31	·34
Oct. 8	·38	·38	·35	·31	·27	·19	·12	·12	·19	·27	·31	·35
„ 18	·35	·35	·32	·29	·27	·21	·16	·16	·21	·27	·29	·32
„ 28	·32	·32	·31	·28	·26	·22	·18	·18	·22	·26	·28	·31
Nov. 7	·28	·28	·26	·26	·26	·24	·23	·23	·24	·26	·26	·26
„ 17	·24	·24	·22	·24	·25	·26	·27	·27	·26	·25	·24	·22
„ 27	·21	·21	·20	·22	·25	·27	·29	·29	·27	·25	·22	·20
Dec. 7	·18	·18	·18	·21	·24	·28	·31	·31	·28	·24	·21	·18
„ 17	·17	·17	·18	·20	·24	·28	·31	·31	·28	·24	·20	·18
„ 27	·18	·18	·18	·20	·24	·28	·31	·31	·28	·24	·20	·18

The moon's upper transit on June 21, 1871 ('British Almanac,' p. 25), takes place at 2 a 50; the equation of time is also 1m. subtractive* from mean time; and from the 'Nautical Almanac' (pp. iii.

* Clock before Sun / Clock after Sun } Equation of Time to be { Subtracted. / Added.

and x.) the moon's horizontal parallax is 55′·0, and her declination is 21° N. The computation is hence as follows:

	h m			Feet.
Transit, June 21.	2 a 50			
Equation of Time	1 sub.			
Apparent Time	2 a 49	Table I.		17·57
Moon's Parallax	55′·0	„ II.		·44
„ Declination	21° N	„ III.		·48
Calendar Correction (June 21)		„ IV.		·11
Height of Tide, 18 feet 7 inches (June 23, P.M.) . . .				18·60

The foregoing tables have been used in computing the heights given in the 'British Almanac' for 1871. Those for 1870 included Mr. Lubbock's correction for diurnal inequality, shown in his supplementary table ('Companion, British Almanac, 1838,' p. 10). It being questionable, however, whether any sensible diurnal inequality really exists in the London Tides, and the whole theory being only an approximate representation, it has been considered advisable to reject this particular table as not sufficiently warranted.

It may not be without some interest to take the present opportunity of briefly pointing out some of the defects of the present state of the Theory of the Tides. In consequence of the irregular formation of the bed of the ocean, the mathematical investigation of tidal phenomena is a subject of very great complexity. The *Hydrodynamical Theory* of Laplace is undoubtedly the true theory, and the ingenious *Wave Theory* of the Astronomer Royal possesses strong points of recommendation; but it is not to be overlooked that the enormous difficulties presented in the actual course of development of these admirable theories, are such as absolutely to require the admission of simplifying conditions that are far from being approximately true, and that these assumptions are such as to unfit them for purposes of accurate computation.

The *Harmonic Theory*, revived and ably developed by Sir William Thomson, upon which a Committee of the British Association is now actively engaged, refers all the inequalities of the tides to the elements depending upon the various combinations of their fundamental periods, and possesses many points of uncommon interest. Mathematically, the theory is free from objection. There is, however, some ground for apprehension, that in thus falling back upon primitive elements, the various inequalities may be found to be so inconveniently numerous and diffuse, as to make the calculation of a tide a work of considerable magnitude.

Messrs. Lubbock, Whewell, and others have, from time to time, discussed large and valuable masses of tidal observations; but, unfortunately, for want of greater strictness in the theory, the results obtained, although of very great utility, are necessarily rough and imperfect.

The heights are arranged according to each half-hour of the moon's transit on the day of the tide. Thus all the tides which took place when the moon passed the meridian between 0h. 0m. and 0h. 30m. (apparent time), are put in one class; all the tides when the transit

occurred between 0h. 30m. and 1h. 0m. in another class, and so on. The mean of all the times of transit, and also the mean of the heights, in each class is taken; and thus a series of times of transit with the corresponding heights is obtained. The interpolation for other times is performed by means of a curve drawn on paper, ruled into small squares. The times of transit being laid down as abscissas and the corresponding heights as ordinates, a curve is drawn approximating to the points thus found. This curve shows the height for all times of transit, and a table is constructed from it. The *Statical* or *Equilibrium Theory* of Bernouilli, although admitted to be radically wrong in principle, is made use of, and its mathematical results are empirically strained to obtain some sort of approximation to the observations.

It is assumed that the time of high water, and the height of high water, both admit of being analysed into separate and distinct portions depending upon—1, the moon's transit; 2, the moon's transit and parallax; 3, the moon's transit and declination; and 4, the sun's parallax and declination. Such an assumption can be true only in the case of linear functions. Thus, for example, taking the simplest case: let $\mathrm{F}(x,y)$ denote a function of two variables, the mean values of which are $x = a$, $y = b$. The function answering to the mean values of the variables is $\mathrm{F}(a, b)$; and the separate corrections, or inequalities, for stated values of x and y are

$$\mathrm{F}(x, b) - \mathrm{F}(a, b)$$
$$\mathrm{F}(a, y) - \mathrm{F}(a, b)$$

To make up the true correction $\mathrm{F}(x, y) - \mathrm{F}(a, b)$ there will, therefore, still remain the residue

$$\mathrm{F}(x, y) - \mathrm{F}(x, b) - \mathrm{F}(a, y) + \mathrm{F}(a, b)$$

and that this will not vanish unless the form of the function is linear, will be made at once apparent by making $x = a + \alpha$, $y = b + \beta$, and expanding in powers of α and β. It is almost unnecessary to state that in the theory of the tides the functions are not linear, that there must be a residual error, and that the same ought to be regarded as made up of more complicated inequalities.

Again, it is assumed that the tide does not virtually depend upon the transit that immediately precedes it, and upon the parallaxes and declinations at that time; but that these elements must be ante-dated by a certain *constant* interval, called *the age of the tide*. This also cannot be strictly accurate. It is manifest that the dynamical effect produced on the tidal wave is truly the accumulated effect resulting from a continued action during a long consecutive series of antecedent positions of the luminaries. The equivalent mean of these positions must necessarily date back; but that it will precede the tide by the same interval, in all cases, cannot hold good even approximately.

The discussion of tidal observations must proceed on a different basis, before a near practical agreement can be expected to obtain between the results of observation and tabular computation. At a future time it is my intention to go into this important branch of the subject.

W. S. B. Woolhouse.

AN EASY METHOD OF DISTRIBUTING THE PREDICTIONS OF A SOLAR ECLIPSE OVER A GIVEN GEOGRAPHICAL AREA.

When an eclipse of the sun is of considerable magnitude, and occurs under favourable circumstances, so as to excite a general interest, it is so much the more desirable that the usual particulars of its phases should be definitely predicted for various localities. The accurate computation of the phases of a solar eclipse for an assigned geographical position is, however, a work of so much complicated detail as practically to prohibit the computer from executing the work independently for many places. The multiplication of labour would not only be extremely repulsive, but the liability to casual error would thereby be proportionately augmented. It was with this view of an important practical difficulty that, in my treatise on the Computation of Eclipses, which forms the Appendix to the 'Nautical Almanac' for 1836, I devoted a special chapter to the investigation of "Formula of Reduction to different Places," an expedient that, curiously enough, had not before suggested itself, although one of very great practical value.

The main results of this investigation established convenient and useful formulæ, applicable alike to all places situated within a certain limited geographical area surrounding a given central station. Thus, for any place whose latitude is l, and longitude λ, the mean Greenwich time t of beginning or ending of a phase of a solar eclipse may be calculated from expressions of the following forms, viz.:

$$\cos \omega = p - \mathrm{A} \sin l + \mathrm{B} \cos l \cos (\lambda + \psi)$$
$$t = (t) - k \sin \omega + \mathrm{A}' \sin l + \mathrm{B}' \cos l \cos (\lambda + \psi')$$

where p, (t), k, A, A′, B, B′, ψ, ψ' are determinate constants, for the computation of which other formulæ are set out in the investigation. In the 'Nautical Almanac' these particular formulæ have, from year to year, been numerically stated for all solar eclipses visible in Great Britain. Thus, for example, take the large solar eclipse about to take place on the 22nd of December, 1870. For any place not far from Greenwich the mean Greenwich time t of beginning may be computed by the formulæ:

$$\cos \omega = 1{\cdot}4718 - [0{\cdot}22465] \sin l + [9{\cdot}88127] \cos l \cos (\lambda + 144^\circ\ 0'{\cdot}0)$$
$$t = 1^{\mathrm{h}}\ 4^{\mathrm{m}}\ 41^{\mathrm{s}} - [3{\cdot}66832] \sin \omega - [3{\cdot}12178] \sin l - [3{\cdot}92829] \cos l \cos (\lambda + 74^\circ\ 12'{\cdot}3)$$

These formulæ, with the use of trigonometrical tables, are well adapted to calculation. The numbers contained within the brackets are the logarithms of the coefficients ready for use.

Many years ago, after the publication of my paper on 'Eclipses,' it occurred to me that a much simpler method, not requiring tables of any kind, and one, therefore, of more general utility, might be obtained by assuming the required value to be in every case a linear algebraic function of the latitude and longitude of the place for which the calculation is proposed to be made. That such an hypothesis may be practically and properly applied to a limited portion of the surface of our globe, Great Britain for example, would appear from the con-

sideration that, within such comparatively circumscribed limits, the small portion of the boundary of the moon's shadow may be conceived to pass across nearly in straight lines and almost with a common uniform velocity. The process is evidently not restricted to eclipses, but may be applied to other phenomena.

For the purpose of having only small numbers to deal with, we may, for any place in Great Britain, conveniently assume the latitude expressed in *degrees* to be denoted by $50° + L$, and the longitude expressed in *minutes of time* $\begin{matrix}+\text{ east}\\-\text{ west}\end{matrix}$ to be denoted by M. Then, according to the hypothesis assumed, the time t of the phase will correspond to an expression of the form

$$t = c + p.L + q.M \quad \ldots\ldots \quad (\alpha)$$

where c, p, q, are three constants to be found.*

Now, if the particulars of the eclipse have been independently and accurately calculated for three outstanding places, such as Greenwich, Dublin, and Edinburgh, the substitution of the results will evidently supply three equations of condition from which the constants can be easily found.

For Greenwich,	L	=	1·4772,	M	= 0
„ Dublin,	L	=	3·3869,	M	= − 25·37
„ Edinburgh,	L	=	5·9564,	M	= − 12·73

If, therefore, the times of the phase at Greenwich, Dublin, and Edinburgh be denoted by the respective initials G, D, E, the equations for determining c, p, q, will be,

$$\begin{aligned} G &= c + 1·4772\ p \\ D &= c + 3·3869\ p - 25·37\ q \\ E &= c + 5·9564\ p - 12·73\ q \end{aligned}$$

Let $G - D = h$, $G - E = k$; then

$$\begin{aligned} h &= -1·9097\ p + 25·37\ q \\ k &= -4·4792\ p + 12·73\ q \end{aligned}$$

from which we find

$$\left.\begin{aligned} p &= ·1425\ h - ·284\ k \\ q &= ·05014\ h - ·02137\ k \\ c &= G - 1·4772\ p \end{aligned}\right\} \quad \ldots\ldots \quad (\beta)$$

By means of this last set of formulæ (β) the constants may be directly calculated for any solar eclipse with respect to Great Britain.

As a practical example, take the solar eclipse of Thursday the 22nd of December, 1870. Independent calculations accurately made for Greenwich, Dublin, and Edinburgh, give the following results, in which the mean times are stated, according to the meridian of Greenwich:

Eclipse ⊙ 22 December, 1870.	Greenwich G	Dublin D	Edinburgh E
	h m	h m	h m
Beginning . .	11 m 7·70	10 m 59·46	11 m 5·50
Ending . . .	1 a 42·10	1 a 31·25	1 a 33·56
Magnitude . .	9 dig. 46·1	9 dig. 44·6	9 dig. 27·4

* The values of the constants might be determined by differentiating the foregoing expressions with respect to l and λ, and then substituting for these variables their initial Greenwich values; but the operations involved would be somewhat complex.

From these the following values are derived in the manner indicated:

—	$h =$ G − D	$k =$ G − E	By formulæ (β)		
			p	q	c
Beginning . .	8·24	2·20	+ 0·55	+ 0·37	11 m 6·9
Ending . . .	10·85	8·54	− 0·88	+ 0·36	1 a 43·4
Magnitude . .	1·5	18·7	− 5·1	− 0·33	9 dig. 53·6

Hence, according to the formulæ (a), we have, for any place in Great Britain, in latitude 50° + L expressed in *degrees*, and longitude $M \begin{matrix} + \text{ east} \\ - \text{ west} \end{matrix}$ expressed in *minutes of time*, the following general epitome of results, viz.:

		h	m	
Mean Greenwich	time of beginning	= 11	m 6·9	+ ·55 L + ·37 M.
	time of ending	= 1	a 43·4	− ·88 L + ·36 M.
	Magnitude of Eclipse	= 9	dig. 53·6	− 5·1 L − ·33 M.

And the values for all localities throughout England, Scotland, and Ireland may thereby be run off with the greatest facility and despatch.

As an extreme test of the formulæ, take Liverpool, a place remote from those upon which the calculations are founded. Here we have L = 3·413, M = − 12·00; and the calculated values are stated below. Their accuracy is shown by an independent computation for Liverpool. The times stated are Greenwich or railway times.

Eclipse ⊙ 22 December, 1870.	From the Formulæ.	Independent Calculation.
	h m	h m
Beginning . .	11 m 4·3	11 m 4·2
Ending . . .	1 a 36·1	1 a 36·0
Magnitude . .	9 dig. 40	9 dig. 39

Although unnecessary, more than three independent computations of a solar eclipse might in like manner be employed as a basis. In such case the constants c, p, q, are to be found from the equations of condition by the method of least squares. To the experienced mathematician it may also occur that some additional accuracy might be attained by the substitution of a general algebraic function of the second degree; but any advantage gained by such an extension would be wholly absorbed in the additional labour, more especially as the process is already abundantly accurate for the practical purposes originally contemplated.

W. S. B. Woolhouse.

MASTERS AND MEN.

"Il est manifeste que les populations ouvrières ne sont pas satisfait de leur sort. Elles élèvent des plaintes de plus en plus vives, des reclamations de plus en plus énergiques et hardies, et comme actuellement elles disposent dans l'État d'une influence étendue, comme elles ont la force du nombre il serait d'une souveraine imprudence de n'en pas tenir compte, quand bien même l'équité ne commanderait pas d'examiner leurs demandes avec impartialité et d'y faire droit dans tout ce qu'elles peuvent avoir de légitime." M. Michel Chevalier. 'Exposition Universelle de 1867. Rapports du Jury International,' tom. i., p. dcliv.

The general relations of capital and labour all over Europe are those of two hostile forces. It is always open war or armed neutrality. No sooner are the rigid combination laws of France repealed, than the working men eagerly avail themselves of the opportunity of forming trade societies, of demanding better terms from their employers, and, in case of refusal, of striking. The Caisse de Resistance, no longer a secret but a public fact, appears destined to play a part quite as important in French industry as it does in our own. That labour suffers most in the battle from the privations and misery its soldiers undergo, is too true. That the welfare of capital and labour are indissolubly connected, is plain to all. But if the ultimate interests of capital and labour are the same, the immediate apparent interests of capital and labour are too often antagonistic. The master's object is to obtain the maximum of work for the minimum of wages, the workman's to give the minimum of work for the maximum of wages. Such, stripped of its rhetorical embellishments, appears to be the meaning of the struggle between the two great industrial forces.* Happily there are other considerations which affect the question—honesty, benevolence, religion, have their influence in mitigating the intensity of the combat.

In 1859 it was estimated that there were 2000 trades unions in the kingdom, containing about 600,000 members, and commanding a fund of 300,000*l*., destined chiefly for the support of strikes.† Gradually the artisan associations are endeavouring to acquire a federal power; no longer confining their operations to their own trade, they aim at uniting in one body the workmen of all Europe. An organisation of this nature could not fail to have momentous results. It is a significant fact, that since 1866 expressions of sympathy and more substantial aid in money have been given to each other by English and French workmen engaged in strikes. Another sign of the times is the International Association of Working Men, who yearly hold a conference in one of the continental towns. Whoever would appreciate the gravity of the labour question should examine the reports of these congresses. He would see in the violence of their language, and the

* Hear what M. Euverte, of Terre Noir, has to say on wages: "The principle which says, 'Obtain as much as possible, and pay as little as possible for it,' is absolutely erroneous. They should say, 'Pay what is necessary to obtain the utmost possible. . . .' 'But,' they ask, 'where is the limit of what we should do?' I do not know a competent tribunal for such a case: I think, however, there is a judge, and a sovereign one; and that is, the conscience of Man."

† 'Edinburgh Review,' October 1859, p. 529.

avowed and intense hatred of the middle-class, manifested in their denunciation of capital and competition, the warning of future danger.

The spectre of red, revolutionary socialism is again threatening Europe. The keynote of the Basle Congress is the saying of M. Michel Bakounin, one of the delegates, and a man of great talent and power. "Private property had never been, and was not now, anything but the individual appropriation of the labour of the collectivity." M. Brisme said "that all the trade societies in the world would not release the working classes from the domination of capital; only a transformation of private property into the means of labour could do it." Professor Hins naïvely remarked, that "by studying the history of the French revolution attentively he had discovered the way in which social transformations could be effected."

Further on we read that the landed proprietor and capitalist has the power of transferring to himself, without equivalent, the labour of others.

This picture of the present relations of capital and labour is not a pleasing one; but it is, alas, only too true. The importance of the question gives interest to all methods which aim at ending fratricidal war, or even at proclaiming a temporary truce between the contending parties. The misery of large portions of the producing classes raises the question, whether the present organisation of labour is the final one? Whether it is the best system to which the wisdom of the ages can attain? Has it more permanence than slavery, than feudalism, than any of those social methods which, having run their course, have finally disappeared? M. Robert quotes the following words from a speech by M. Laroche-Joubert, a paper maker, whose manufactory employs about a thousand men: "Whilst they will not consider, in France, that for all industrial enterprise there are three elements equally worthy of respect, and equally indispensable; whilst they will not completely understand this simple truth, strikes will certainly happen and increase in frequency. It is necessary that at last people should recognise the fact, that if intellect and capital are indispensable to the conception, creation, and organisation, and to the direction and working of all industrial undertakings, labour is an auxiliary not less necessary. Whilst, then, in French society they do not treat as equal to each other these three elements, of which each is as inseparable as the other from the success of an industrial undertaking, whilst, in short, they do not give a better portion to labour, they will be exposed to the renewal of strikes. If, some day, they solve this question, which, I think, is not insoluble, by according, in just and legitimate proportions, a portion of the profit to intelligence, to capital, and to labour, they will remove the cause of strikes, and with the cause, strikes themselves." In discussing the question, it is sometimes forgotten that labour has rights as well as duties. And here comes the practical difficulty of the problem—how to divide in equitable proportions the result of the joint efforts of capital and labour. In preceding volumes of this publication may be read the history of co-operation—the remarkable efforts of the working-classes at home and abroad for the solution of this momentous question of social economy. In these pages has already been narrated what Mr. Holyoake has so well termed the history of self-help by the people.

In the present paper we propose to chronicle some remarkable attempts made by employers for the attainment of the same object, to give examples of complete harmony between employer and employed, brought about by the action of the capitalist, to show in what manner those captains of industry, conscious of their own high vocation, have cared for the wellbeing of the industrial army under their command. The socialist movement in Europe has had important results. "It has awakened in the workman a sense of his social rights, and in the well-to-do classes a sense of social duty." These are the words of one of the leaders of modern socialism, Deputy Johann Jacoby. He adds: "We willingly acknowledge this; there are manufacturers to whom the workman is not a machine to be bought, like any other merchandise, at the lowest possible cost, in order to make the greatest profit, and then be cast off." The cynical disregard or ridicule of human suffering among the poorer classes which one finds in literature and history so late as the last century would be impossible now. And this good, at least, appears to be owing to socialism. Fourier and Owen may have been dreamers, unable to translate their theories into practice, but they had the merit of seeing and making others see the full meaning and importance of the problem of social organisation, which they endeavoured to solve. Owen, who, before he began to preach his fatalist doctrine, was a prosperous Manchester manufacturer, seems to have been one of the first of the class to which Jacoby has alluded. He took a deep and earnest interest in the welfare of his "hands," and was more than once thwarted in his schemes for their benefit by the more selfish feelings of partners who were devoid of his sense of duty, and who did regard men as superior kinds of machinery, out of which it was desirable to grind as much work as possible. At New Lanark his estate was a Maine-law village half a century before such a thing was dreamt of elsewhere. Stores were opened where the workpeople could obtain articles of food and clothing at a small increase on wholesale prices, and even the slight profit was devoted to educational purposes. Schools were provided for the infants and children, and night-schools for the adults. There was a dining-hall and kitchen, by which the waste of separate cooking was avoided. A library, a reading-room, and a ball-room were also added. "When the business of the day was over, the people would assemble in one of the large rooms, and pass the evening in singing and dancing. As many as seventy couples might be seen standing up together. There was a concert every week, and 150 voices sometimes joined to sing the popular ballads of Scotland." No punishments was the rule, both in the factory and the school; the influence of public opinion was the only penalty brought to bear upon the offender. Even theft was allowed to go unpunished, save by this method, which was found so efficacious that it diminished 700*l.* in extent. His arrangements were singularly successful. The twist manufactured was famous. The profits were great; and, although the wages paid were below the average, no strikes suspended the labour at New Lanark, nor did Ludd venture to break a single frame there. Owen was equally beloved by children and parents. Few experiments have been more completely successful than the New

Lanark mills under the management of Robert Owen. Whatever may have been the vagaries of his later career, a debt of gratitude is due to the man who first appreciated duly the rightful claims of labour, and who performed so nobly the duties which devolve upon a great employer of it. For the sake of human nature we are glad to say that he has had many imitators. It is to the honour of employers that the roll should be so long. The names of Salt of Saltaire, Adams of Nottingham, Hugh Mason of Ashton-under-Lyne, Jonathan Richardson of Bessbrook, Akroyd of Halifax, Ransome of Ipswich, and many others, will at once occur to the reader's mind. Some have built schools, some dwelling-houses, some have established dining-halls, reading-rooms, libraries, others have built baths and given recreation grounds. The only difficulty under which we labour is that of selection. One remarkable example occurs to our mind as most proper for examination in detail, for the reason that it furnishes in combination nearly all those features which excite our interest and admiration, even when they occur in isolation.

The little town of Guise, in addition to having had the honour of giving a name to the proud house of Lorraine, has in our days been the witness of a remarkable attempt to solve the Sphinx question of modern times which we are now discussing.

M. Godin-Lemaire, the founder of the Familistère at Guise, was born in the neighbourhood of that town in 1820. Architect of his own fortunes, his early years, his apprenticeship and wanderings, brought him face to face with the evil forces which hold back the workman from well-being and content. He knew all the bitterness of the labourer's position, all the heavy weight of poverty and wretchedness which often crushes him down into the dust. Not from fine schemes of philosophy, not from the eloquent words of unreal dreamers came his acquaintance with the "labour question." It was his question, the question of his life, for he himself experienced every misery that can fall to the lot of the worker. But he was made of stronger metal than the general run of mankind, and rose triumphant out of the waves which overwhelm so many. Fortune smiled on his energy and iron determination, and when commercial success had placed within his hands the means, he did not forget, as so many do, the golden dreams of his youth. In prosperity he did not look down upon those weaker brethren who were still groaning beneath their burdens at the foot of the hill, weary and heavy laden. In his youth he had been an attentive student of the socialist literature, and the fact need not be disguised that to the reveries of Fourier and Considerant we owe the successful experiment of the Familistère. As we shall see, however, on examination, there is nothing wild or visionary about M. Godin-Lemaire's proceedings for the benefit of his workpeople. Everything is subordinate to the dictates of utility and common sense. M. Godin-Lemaire is a manufacturer of stoves and ranges, employing about 700 men, and he has attempted to secure their well-being, without either State aid or charitable alms, two fatal ingredients which have destroyed the success of many well-meant efforts.

Whoso passes through Guise will not fail to notice a large and handsome building of considerable architectural elegance, surrounded

by extensive and beautiful gardens, and if he be familiar with the ordinary dwelling-places of the working-classes he will learn with astonishment that this is the home of the workmen employed in a stove foundry. Yet such is the case, the builder of this palatial structure having determined that nothing should be omitted that could tend to inspire the workman with dignity and self-respect, and that, as in the ordinary course, the miserable hovel is the commonest and perhaps the most galling sign of social inferiority and degradation, so in this new experiment the very walls should be forced to aid in the elevation of the inmates. The object of this building is "to give a strictly private home to each workman, combining with it, the nursery, where his wife, while engaged at work may deposit her infant; the infant-school, where his children between the ages of two and five, may be gradually prepared for the school properly so-called, in which their education may be carried on until the age of twelve; fitting them not only for their industrial calling, but for the proper fulfilment of their social duties; playgrounds, where by healthful exercise, their physical development shall be ensured without necessarily exposing them to the baneful influences of the street; stores where provisions and garments may be procured at wholesale prices; reading-rooms, baths, washhouses, all, in short, that can render home healthy, attractive, and elevating."* Such is Mr. Godwin's comprehensive summary of the work of the Familistère. From the same high authority we quote a few words descriptive of the architectural arrangement. "Another pile to be put up presently, and enclosing with those already erected, a vast court, will complete the work. The buildings externally are architecturally designed, ornamented with coloured bricks, and made to take a dignified character. The principal block forms the side of a square, about 262 feet wide, and has in the centre of it a court about 148 feet by 66 feet, covered with a roof to form a playground for the children, and having special means of ventilation. The gallery plan, as we term it, with external staircases, is adopted to give independent access to each set of apartments, and seems to be less known in France than here, as it is described as a novelty by those who have given particulars of the Familistère. The galleries are by them termed 'hanging streets;' they are formed in this building, simply by carrying the joists of each floor about five feet beyond the walls, boarding, and a light iron railing at the edge complete them." The buildings thus described stand on a peninsula of the river Oise, six hectares in extent, and garnished with gardens and groves. Let us now examine more closely the arrangements of the principal building, which we shall do under the guidance of M. Oyon, whose work on this subject, so lucidly written, and with such evident sympathy, is the best to which we could turn for information. Although the size of the apartments varies slightly, the general arrangement is the same. Fronting the gallery or hanging streets is a door, and on either side of it a window. Entering through this door we find an entrance-hall, exactly half of a square, the remainder being occupied with pantries and closets accessible only from the interior. At each side of the entrance-hall

* Geo. Godwin, F.R.S., in 'Social Science Transactions,' 1865, p. 460.

is a door by which we enter the first apartment, the window looking out upon the gallery and courtyard; the second chamber is approached through the first, but is somewhat larger and lighted by a window, forming a portion of the exterior of the Familistère and looking out upon the country. The arrangement of the rooms on each side of the entrance-hall is the same. Each set of apartments in fact is a square of which that half nearest to the exterior is divided into two rooms of equal size, whilst of that portion which looks upon the court two-thirds are devoted to the two rooms, one-sixth to two pantries, and one-sixth to the entrance-hall. The three galleries which run the entire length of the interior, and which are reached by four staircases at each corner of the courtyard, have all the advantages of streets, without their noise and danger. From the windows looking upon these hanging streets the mother can watch the children as they romp and gambol in the vast playground which the courtyard furnishes. Even in winter when the wild winds, the rain and the snow would otherwise keep them prisoners, they may here play in full security, protected from the inclemency of the weather by an immense glass roof which covers the courtyard, ascending higher than the top of the entire building. Even the floor is a proof of M. Godin-Lemaire's love for childhood. "Le sol de cette cour," says M. Oyon, "est un nappe de ciment battu et poli." A fall in this model playground would not be very serious. Under the courtyard and buildings there are cellars, which besides the accommodation they afford the inhabitants as granaries, &c., serve as a valuable means of ventilation and drainage, and prevent any fear of infiltration from the neighbouring river rendering damp the buildings of the Familistère. Under the court is an immense vault supported on pillars; at the north end are two large bays giving free access to the air. Along each side are the vaulted arches which serve as cellars; there is also a covered drain which conveys all the water that can filter through to a place whence it can at once be pumped up. Ventilation grids run all round the vault at the level of the courtyard. When the heat is excessive the air can be rendered delightfully fresh and cool by watering the soil of the court. "How few houses, even in Paris," observes M. Oyon, "unite such conditions of comfort and health."

An abundant water supply is ensured; at each "landing" of the four staircases is a water fountain, from which twenty litres for each inhabitant are daily taken. The general cleanliness of the establishment is secured by the employment of a number of the female inhabitants, to sweep, and wash, and keep in good order the staircases, court, and all outside the several houses. This, besides giving employment and an additional source of income to the workmen's wives and daughters, is not without influence upon the internal tidiness of the apartment. On the ground-floor of the building are retail stores, where all articles of necessity in food and clothing may be obtained, better in quality and cheaper in price than could be got at the expense of a tiresome journey to market. There is also a restaurant, where well-cooked food may be purchased, either for consumption upon the premises or at home. A person might live reasonably at this restaurant, such, at least, is M. Oyon's opinion, for something between eightpence

and a shilling daily. The workmen have a club-house—le Casino—containing a reading-hall, billiard-room, &c.

They have also organised amongst themselves a band of music, with a regular leader, and a night in each week is devoted to practice. M. Godin-Lemaire supplies the requisite instruments, and we are told that the pieces selected for performance indicate a cultivated musical taste. Sickness is attended to at the cost of a friendly society of the workmen, the medical man calling every morning at the steward's rooms in search of patients. The health of the inhabitants, as might be expected, is much better than is generally the case with masses of working people. In the first four years the infant mortality was eight per cent. below the general average. Washhouses enable the women to abolish that constant source of discomfort and quarrel, the washing-day. Warm and cold water baths may be had by the adults for twenty-five centimes; for children and sick persons even that small charge is remitted. We have already mentioned an instance of the love for children which would appear to be a leading feature in the character of M. Godin-Lemaire. We now come to some remarkable manifestations of the same kindly trait. It is noticeable even in the nomenclature which he has adopted. The words *crèche* and *asile* have acquired a connection with the idea of charity which is undesirable in a workman's home. The nursery, the place where the baby is lodged and cared for, he calls the *pouponnat*. Here at all hours the mother may bring her infant, may attend to its wants herself, or give it in charge to one of the nurses. Everything that can add to the comfort or health of the little ones is provided in abundance. The nursery, like the stores and restaurant, finds suitable employment for the wives and daughters of a portion of the workmen. The fullest liberty is allowed to the mothers as to leaving and taking away their infants. Day or night no child need be neglected at the Familistère. When the infant becomes too old to be placed in the pretty iron cradles of the nursery it may be sent to the *bambinat*. This word, derived from *bambin*, a child, as the other is from *poupon*, an infant, cannot be literally Englished. An infant school of the best class corresponds most nearly to the *bambinat* at Guise. Here, whilst yet too young for actual study, the child learns some elementary lessons of singing, of counting, and even of drawing. At six years of age his mind is well prepared for the reception of the more systematic instruction which the next six years will afford him. A peculiarity of the school discipline is the mixture of girls and boys in the same class. The division of sexes is, however, preserved, the males occupying one distinct portion of each class and the females another. The course of instruction is the same, nay, the girls have the advantage, for they receive also lessons in domestic economy, which are not considered necessary for the boys. The system of teaching is that known as the simultaneous plan, and it appears to be very efficacious in stimulating all the scholars to quickness and attention. Crosses of honour are distributed every week among the most deserving scholars; and in calculating the claims to these distinctions a novel method, and one more just than the common plan, has been adopted. The pupil is tested, not by comparing his present

knowledge with that of his fellow scholars, but by the actual progress which he has individually made during the week. An exact account, by marks, is kept of each addition to his store of scholastic lore, and the simple adding up of this register points out the most deserving students. Reading, writing and arithmetic, grammar, composition, geography, such is the course of study; but arithmetic here does not mean merely an imperfect acquaintance with the first four rules, but extends to the rule of three, extraction of square roots, accounts, &c. As to the condition of the school, we have the testimony of Mr. Pagliardini. Proceeding from so well-known an educationist, it will have weight. "The progress of the children is wonderful, and I think would very much surprise the examiners of the national, aye, and of other higher schools. Being myself an examiner, I watched all with an hypercritical eye, and was delighted with the ready and correct answers that were given on both sides of the school-room. The bound copy-books in which the dictations are done, were, one and all, models of neatness; not a blot, not a scribbled word could I detect in any one, and I felt a blush rise on my cheek for the sons, and I had almost said the daughters, of gentlemen, whose exercises so frequently pass under my eyes. The books in which they copy their sums are also irreproachably neat." The novelty of bound copy-books, mentioned in the above extract, refers to M. Godin's plan of having the school-books in neat and handsome covers, that the children may prize and take pleasure in the outward appearance of these educational agents, and so be tempted to the pleasant fields within. The general superintendence of the nursery, infant school, and school is entrusted to a highly gifted lady, a relative of the proprietor; and one of the rewards held out to the good children is the privilege of visiting on Sunday "chez Mademoiselle Marie." This favour is highly prized by the children, who look forward with great delight to the prospect of being the guests of their kind instructress.

The *pouponnat*, the *bambinat*, the school, are all free, but if a child is absent from school without proper reason, the parents are fined ten centimes. Whilst all these advantages are offered to the workmen, there is no attempt at compulsion. None are forced to live in the Familistère, to purchase at the stores, to resort to the reading-room, or the bath. It is perfectly optional for them to accept or reject the agents of wellbeing which M. Godin-Lemaire offers to them. Moreover, and this is perhaps the most important point of all, the Familistère is not a vast charity, the whim of a rich and eccentric man; it is a commercial enterprise, and a successful one, yielding a profit of six per cent. At what rent, then, are these apartments let? Mr. Tito Pagliardini shall tell us: "The rent of the unfurnished apartments, of from one to five rooms, is at the rate of 4f. 50c., or 3*s*. 9*d*. a calendar month for each room. The apartments consisting of five rooms and a kitchen, with numerous closets and cupboards, the rent of which, free of all taxes and repairs, is 18*l*. a year, are such as, on the third floor in Paris, would be cheap at 120*l*. The cost of a furnished room for a single workman, with a bed, two mattresses, a washstand complete, a slop-pail, a looking-glass, two or four chairs, one or two tables, two towels a week, bed linen changed

twice a month, the bed made, and the room swept and put in order every day, is 8f. or 10f. (6*s.* 8*d.* to 8*s.* 4*d.*) a month. A separate bed may also be engaged in a dormitory at the small rate of ten centimes (one penny) a day."* Wherever possible, employment is furnished to the females who may desire it in the management of stores, cooking depôt, &c. At the feast of St. Eloi there are great rejoicings, the large courtyard being brilliantly lighted with gas, and the musical society exerting their harmonic talent to the utmost, whilst 180 couples of gay dancers foot it merrily on the light fantastic toe. Such is a brief and imperfect outline of the arrangements of the Familistère of Guise, where even the most trifling points of detail appear to have been carefully considered, and where everything conspires to promote the happiness and peace of the worker, to inspire him with just ideas of the sacredness of toil, and of his own dignity as Man. At the present time M. Godin-Lemaire is in process of converting his establishment into a joint-stock company, descending as low as coupons of 25 francs (1*l.*), and so enabling all his workpeople to become participants in the profits of the enterprise. When the foundation stone of the building of the Familistère was laid he pronounced these solemn words :—"Dieu nous soit en aide, Hommes soyez-nous favorables."

To a nature so noble and thoughtful as M. Godin-Lemaire's can we wish a greater reward than the fulfilment of this prayer? May that aid and favour which he desired be his in overflowing measure, that he may prosecute his labour of love for the rescue of the worker from misery, vice, and degradation.

We would willingly narrate the efforts which have been made by the wealthy employers named in a preceding paragraph, and many others who have distinguished themselves in the same benevolent manner. They deserve at least the tribute of recognition and gratitude, a tribute we freely yield to them, but the objection might be raised that such action, such munificence, is possible only to men of great wealth and leisure. It is true, that the possession of riches largely increases the power of adding to the general sum of happiness, but they are not necessary for the existence of the competent harmony between master and men. The question, it will be seen at once, is both moral and economical. The first part we can only consider here incidentally. Truthfulness, frankness, and considerate kindness will win their way to all hearts, and the master who practises these virtues need not fear that he will be a stranger in the hearts of his men. For the economical question there is a system which, judging by its results, affords a simple solution of the difficulty.

What is wanting is some plan which shall unite the jarring interests of employers and employed, and be equally applicable to large and small undertakings. In co-operation the workman is capitalist also, and the harmony of interests is complete; in the existing system the capitalist and the worker are distinct individuals, with clashing aims and objects; midway between the two systems is that known as industrial partnership. If, on the one hand, it has not all the advantages of complete co-operation, on the other hand, it avoids some of its dangers.

* 'Social Science Review' (N.S.), iv. 343.

In 1861, Dr. John Watts said: "If the real co-operative societies extend and succeed, it is possible that we may see individual employers, in self defence, constituting their workpeople partners in profits, in the belief that the extra interest excited in work would make the employers' share of profit greater than the whole amount formerly obtained. Such an arrangement would also tend to prevent strikes, for if the hands thought the wages too low, they would see it made up by profit, so that the result would simply be an enforced measure of prudence."* This was a prophecy after the event, for, like many other *novelties*, industrial partnership is older than is generally suspected, and has long been successfully practised abroad. One of the most notable examples in France is that of the Railway Company of Orleans. Since 1844 a number of the persons employed by this company have participated in the profits. The sums actually divided amongst workmen are thus stated:

	frs.	cts.			
In 1844	60,468	50	amongst	719	employed.
,, 1845	173,411	40	,,	816	,,
,, 1846	314,966	16	,,	957	,,
,, 1847	353,311	76	,,	1,269	,,
,, 1848	33,016	25	,,	1,306	,,
,, 1849	274,458	40	,,	1,065	,,
,, 1850	247,701	41	,,	1,025	,,
,, 1851	382,714	73	,,	1,004	,,
,, 1852	1,153,951	53	,,	2,800	,,
,, 1853	1,966,963	50	,,	3,365	,,
,, 1854	1,541,635	19	,,	4,397	,,
,, 1855	1,873,905	84	,,	4,837	,,
,, 1856	1,772,909	88	,,	5,187	,,
,, 1857	2,024,423	90	,,	5,765	,,
,, 1858	1,996,543	44	,,	5,940	,,
,, 1859	2,092,139	73	,,	6,009	,,
,, 1860	2,181,503	32	,,	5,991	,,
,, 1861	2,162,558	04	,,	6,053	,,
,, 1862	2,132,197	54	,,	6,194	,,
,, 1863	2,132,304	19	,,	6,742	,,
,, 1864	1,896,073	22	,,	6,997	,,
,, 1865	1,766,134	27	,,	9,712	,,
,, 1866	1,774,712	07	,,	10,181	,,
,, 1867	1,770,901	64	,,	10,472	,,
,, 1868	1,775,559		,,	11,376	,,
Total for 25 years,	33,814,465	51			

Those who have the benefit of this bonus to labour are the servants of the company employed by the year, and who appear to form the greater proportion of the employed. The company also offers advantages in obtaining healthy dwellings and good food. The stores which it established sold to its servants at cost price, neither gaining nor losing. The per centage of saving upon the retail prices was 45 upon wood, 64 upon charcoal, 43 upon coal, 75 upon chips, 60 upon potatoes, 115 upon salt, 62 upon vinegar, 33 upon wine, 100 upon dried herrings, 66 upon salt pork, 127 upon smoked ham; in clothing the average saving was 34 per cent. As the improvidence of the working class is a phrase that is often, parrot-like, repeated from mouth to mouth without inquiry as to the justice of the charge, it may be worth pointing out that saving is not always possible for the worker. The wages of miners employed by a company on the Loire

* 'Journal of the Statistical Society,' December 1861, p. 505.

were respectively 3f. 92c. and 2f. 60c. for those employed in the pits and on the surface. The director of this company estimated that the necessary expenses of a miner, if a bachelor, amounted to 2f. 50c.; and, if married, to 3f. 75c. a day. To return to the Compagnie du chemin de fer de Paris à Orléans, it is pleasant to find that, in spite of the heavy item in its expenditure of the bonus to labour, the costs of working are generally less than those of the other railway companies. The testimony appears to be general that the system has the effect of obtaining a better quality of work, and that it also acts as a stimulant to the productive powers of the workman.

In 1851, 18,306 tons of iron were produced at Creusot, but on the adoption of the plan of giving a bonus to labour, it rose, in 1852, to 24,860 tons, and in 1856 it reached 42,200 tons. At Terre-Noir the result is still more marked. In 1858 the amount produced was 13,229 tons. On the adoption of this system the amount steadily increased, and in 1868 was 34,521 tons. "This result," says M. Robert, "is attributed entirely to the influence of the new system."

M. Paul Dupont, the eminent printer who employs 1200 men, pays a bonus to labour amounting to 10 per cent. of the profits. He has in many other ways shown his solicitude for the comfort and well-being of his workmen. They have a co-operative store, friendly society, library, lecture-hall, and singing classes. Attached to the works is a free school, and there is also what our New England cousins would call a sewing-circle, where they make clothes for the poor on the Sunday.

And before any horror-struck Englishman cries out against this charitable Sabbath-breaking, it might perhaps be well to inquire if the majority of our own countrymen employ themselves on that day in anything nobler. Truly, if work and charity are worship, there are devotees in the Sunday workroom of M. Paul Dupont!

Many other firms have shown great liberality in providing for the wants of their workpeople, and in stimulating them to industry and carefulness by rewards in the shape of a percentage of profits. This is the case in the silk and velvet manufactory at Viersen, carried on by the Baron de Diérgardt. Established in 1816, these works, owing to the personal character of the proprietor, have always been remarkable for the goodwill and harmony existing between employer and employed. His workmen are forbidden the use of fermented liquors.

The principle has also been applied to agricultural labour by Herr J. H. von Thünen, a man whose name ranks high in Germany, both as a scientific farmer and as a political economist. The case is all the more interesting from the fact that the experiment was in this instance made by a scientific man who had for nearly fifty years kept the most exact register relating to the management of his estate. In 1848 he determined to give his workers a share in the profits of his farm, with a view to providing for them in old age. Tellow had produced, on an average, 7500 thalers yearly, and Thünen proposed to his workmen, "that if, after the deduction of certain expenses, the revenue of the estate should be more than 5500 thalers, to every one of his labourers ½ per cent. of his surplus produce should be credited."

At the end of the year the labourer's share of the year's revenue is

entered in the book of the savings-bank, but each labourer receives interest for his share at the rate of 4½ per cent. The capital is not withdrawable until he is sixty years old; if he dies before, his heirs inherit the amount placed to his credit. Thünen calculated that each labourer would receive about 10 thalers yearly; but the impetus given to careful management by this plan has increased the revenue of the estate to a figure which gives the labourer 25 thalers yearly; and some of the older workmen have about 500 thalers (75*l.*) in the bank.

A new impulse has been given to the plan of industrial partnership in Germany. Dr. Engel, Director of the Royal Board of Statistics in Prussia, and a warm friend of co-operation, having heard of the formation of industrial partnerships in England, obtained further information from Mr. Greening, recommended the system in a lecture delivered before the Juridical Society of Berlin, in presence of the Crown Prince and many distinguished members of the North German Parliament, and induced two large manufacturers at Berlin to adopt the plan. It is also on trial at the carpet manufactory of M. Hoas, of Vienna. M. Fred. Krupp, in his steel foundry at Essen, in Prussia, has also partially adopted this plan, and has in addition made great efforts for the wellbeing of his workpeople, for the encouragement of forethought and saving, and for the repression of drunkenness and immorality. It is also acted upon at Manilla, amongst the Chinese shopkeepers, who give their servants a share in the profits of the concern; and this extends even to the coolies, who, though in general most complete eye-servants when working for fixed wages, are found to be most industrious and useful ones when interested even for the smallest share.

The Bay State Shoe and Leather Company, in 1867, at the suggestion of their agent, Mr. H. H. Bigelow, offered their workmen a bonus on labour, amounting to 25 per cent. of the net profits; and although the year was one of very bad trade, the profits amounted to 14,000 dollars, of which sum 3500 dollars were paid to the workpeople, in addition to their regular wages. "In the evening the workmen and their friends, some 500 strong, gathered in the east wing of the establishment, and under the exhilirating effect of music, oysters, and speeches, commemorated the event of the first successful co-operative movement in Worcester."

Messrs. R. T. and C. Crane, North-Western Manufacturing Company, of Chicago, made an offer of this nature to their hands during the eight hours' agitation of 1868. The offer was gladly accepted by the workmen, and the first year's report showed that, after paying capital its interest, there remained 1620 dollars as a bonus to labour, and the affairs of the company were so prosperous that there was every chance of a still larger dividend for the future. It is also the rule at the famous Pacific Mills at Lawrence, Massachusetts, and with the happiest results. The workmen have 12,500*l.* invested in the company. There are 825 females employed in the mill, and Mr. Chapin has built for them houses, where they live under the care of matrons appointed by the company. A third of the wages forms payment for lodging, board, &c.; a second portion defrays the expenses of dress, &c.; and the third is generally accumulated for a

marriage portion. One girl is mentioned who was thus able to defray the college expenses of her lover, who was a student of medicine.

The plan has been tried abroad under very varied circumstances, and with apparently universal success. In addition to the examples we have cited, we might name the house of Leclaire, Defournaux, & Co., house painters, of Paris, which for twenty years has been constantly cited as a proof of the value of the plan, the type-foundry of Laurent Deberney, the piano manufactory of A. Bond, the oil manufactory of M. Gisquet at St. Denis, and the engine-foundry of M. Beslay in the faubourg of the Temple, where the system has been productive of highly satisfactory results.

The plan was first tried in England by the Messrs. John Crossley & Sons, carpet manufacturers of Halifax, and has been productive of great good both to employer and employed.

This firm was founded by the late John Crossley, above sixty years ago, and in 1864 was converted into a limited liability company. At that date, the proprietors were John, Joseph, and Sir Francis Crossley, all noticeable for their public spirit and benevolence. The town of Halifax owes to the munificence of the three brothers two different sets of almshouses; an orphanage, intended to accommodate 400 children, and a very beautiful "People's Park." This was the gift of Sir Francis Crossley, and cost 35,000*l.* in forming. The sum of 6300*l.* was also given to the corporation to be invested for its future maintenance. It covers more than twelve acres of ground situated in the centre of the borough, and its arrangement is a marvel of good taste and beauty.

The total number of persons in the employ of the Crossleys is 4795, i.e., adult males, 1881, females 1360 (354 of whom are married); young persons within ages of 13 and 18—males, 600, females, 504; children, males, 259, females, 191. These children are all over eight years of age, and are employed, in accordance with the Factory Acts as "half-timers" until they are thirteen. There are 1031 shareholders in the company. The capital of the company is divided into 110,000 shares of 15*l.* each, 10*l.* being paid up. Sixty hours a week is the duration of labour, and the average wages is 13*s.* 1*d.* per head. The number of females and young folk employed must be borne in mind in connection with this average, the youngest "short-timer" receiving 2*s.* weekly.

Piece work has become the general rule of the establishment, and is found to be preferable to day work. The employed have a sick and burial fund, which is fed by their subscriptions, by donations from the company, and from the fines which are levied for late attendance at work. Ten shillings weekly for males and four shillings for females is the sick allowance, 10*l.* and 5*l.* respectively paid at the death. A fine reading-room containing newspapers and magazines has been provided, and also a library containing 3279 volumes. The articles of association are so framed as to leave the business as much as possible like a private concern. The experiment was a novel one, and great powers were therefore wisely retained by the old firm, who became the irremovable governing directors of the new company, holding four-fifths of the shares in their own hands, and in every way retaining

"supreme control in the management of the concern." The distinctive features of Messrs. Crossley's plan of industrial partnership are, "Firstly, in the allotment of the shares of the company, by giving a decided preference to applications from managers and operatives employed by them, as promised in the prospectus, and in no case refusing any application of this kind, or allotting any less number of shares than were applied for. Secondly, and principally, by various loans of money, amounting in the aggregate to no less than 56,150*l.* to the managers, clerks, foreman, and workpeople, to enable them to take up what are termed in the articles of association retained shares in this company, for which interest is charged at the rate of 5 per cent. per annum, and the several accounts credited with the dividends accruing from the shares thus allotted. These retained shares will pay themselves off on the 3rd of February, 1872, with 13*s.* 6*d.* per share over if we should continue to pay 20 per cent. per annum. Should we in future pay only 15 per cent. per annum, they will pay themselves off on the 3rd of August, 1873." This will be better understood by the following "accurate copy of the account of one of the foremen to whom ten shares were allotted on this principle":

"JOHN CROSSLEY AND SONS, LIMITED.

"Retained Share Ledger.

Dr. "——— ———, *Foreman.* *Cr.*

		£	s.	d.			£	s.	d.
1864					1865				
Dec. 1.	To calls upon 10 shares, Nos. 108,900/9 .	35	0	0	June 1.	By Dividend.	1	5	0
					Dec. 2.	,, Balance .	102	9	7
1865									
Mar. 1.	,, do.	30	0	0					
June 1.	,, do.	35	0	0					
		100	0	0					
,,	,, Interest . .	1	5	0					
Dec. 1.	,, do.	2	9	7					
		103	14	7			103	14	7
					1866				
,,	Balance. . .	102	9	7	Feb. 3.	,, Dividend.	7	8	9
1866					Aug. 3.	,, do.	7	7	6
Dec. 1.	,, Interest . .	4	12	1	Dec. 1.	,, Balance .	92	5	5
		107	1	8			107	1	8
					1867				
,,		92	5	5	Feb. 4.	,, Dividend.	12	5	10
1867					,,	,, Balance .	80	15	6
Feb. 3.	,, Int. 64 days		15	11					
		93	1	4			93	1	4
,,	Balance. . .	80	15	6					

"Correct Abstract,

"BENJAMIN MUSGRAVE, *Secretary.*"

By this plan of "retained shares" the workman is enabled to purchase shares at par, whatever may be the price which they will fetch in the general market. The experiment has been thoroughly successful, the directors, with the just pride of pioneers in a difficult path, "claim originality in this mode of securing the direct interest of

the employed, and rejoice in being able to report the system has more than realized their highest expectations." It is curious that the plan, although not introduced into practice earlier than 1864, was proposed nine years earlier as a method of solving the labour question, by Mr. John Frearson, in a work entitled 'The Relative Rights and Interests of the Employers and Employed discussed; and a System proposed by which the conflicting Interests of all Classes of Society may be reconciled. By M. Justitia, London, 1855.'

In this work Mr. Frearson has examined the entire subject of the organisation of labour, and although the work does not appear to have attracted any great attention, it is one deserving of serious consideration. Partnerships of labour have now been established in various trades. In 1866, Mr. J. M. Ludlow writes:

"The rapid spread of the Industrial Partnership, or Partnership of Industry system would have been impossible if the worker were not by this time admitted by his employer to be capable of being, as a shareholder, associated more or less closely in the management of large concerns; or, as a mere bonus-receiver, of being stimulated to greater exertions by the hope of a distant addition to the amount of his wages. This system is now under various modifications, being applied by Messrs. Briggs & Co. and the South Buckley Mining Company to mining; by Messrs. Fox, Head, & Co., to iron works; by Messrs. Greening to another branch of iron manufacture; by the Cobden Memorial Mills to the cotton manufacture; by Messrs. Blythe & Co., and by Messrs. Lloyd and Summerfield, to the earthenware and glass manufacture; by Mr. Goodall, of Leeds, to printing, &c. The principle, as we have seen, is being adapted by the working class on their own undertakings, as by the cabinet-makers or the frame-makers and gilders. Thousands of working men are in these various establishments learning to enter into the position to share the interests of the employer class. The commercial success of these undertakings is already patent to the world in the handsome dividends already paid by the older established ones to their shareholders. One sample only of the efficacy of the principle drawn from quite another quarter than those hitherto indicated shall be given. The respected chief of the tonic-sol-fa school writes thus: "We have tried the partnership of industry plan in our printing office at Plaistow for a year. Before that the office yielded us either 2½ or 0 per cent.; since we adopted the plan it has yielded 5 per cent., and promises to yield more. *But, still better, it saves me no end of vexation and care.*" *

Most of the associations named are still in successful operation. Perhaps the most notable example is that of the Whitwood Collieries. Ten years at the Whitwood Collieries saw strikes, evictions, unionist outrages, riots, and the mutual distrust and dislike between employer and employed which such a state of things indicates. "During those ten years, of almost daily recurring annoyance and anxiety," says Mr. H. C. Briggs, "we went through the varied and painful experience of enforcing evictions from our cottages; guarding, with the aid of the police, non-unionists from the attacks of desperate unionists;

* 'Progress of the Working Classes,' by J. M. Ludlow and Lloyd Jones. 1867, pp. 145–7.

the receipt of threatening letters on the model of those revealed before the Sheffield Trades Unions Commission; the whole culminating in a riot in the village on the night of the 24th of September, 1863, and the consequent prosecution and conviction of some of the ring-leaders at the following York assizes." With all the care and anxiety that such a state of things must bring, the profits of the enterprise in some years did not exceed 3½ per cent., and the average did not rise beyond 5 per cent. In November 1864, it was determined to convert it into a limited liability company, the firm retaining two-thirds of the share capital and the entire control of the management, but giving a decided preference in allotting the remaining shares to the servants and customers of the firm. In addition to this scheme, their proposal included the following: "In order, however, to associate capital and labour still more intimately, the founders of the company will recommend to the shareholders, that whenever the divisible profit accruing from the business shall (after the usual reservation for redemption of capital and other legitimate allowances), exceed 10 per cent. on the capital embarked, all those employed by the company, whether as managers or agents at fixed salaries, or as workpeople, shall receive one-half such excess profit as a bonus, to be distributed amongst them in proportion to, and as a percentage upon, their respective earnings during the year in which such profits shall have accrued." The men were not without their suspicions as to the good faith of this proposal. Ten years of suspicion and dislike do not disappear in a day. During the first year only 30 per cent. of the men qualified themselves to receive the bonus. At the end of the first year capital received 12 per cent., and 1800*l.* was devoted to the formation of a bonus fund, from which the workmen received a bonus of 7½ per cent. upon their wages. Many of the workmen "had a 5*l.* note in their possession for the first time, and some had two, the highest bonus paid to a miner being 10*l.* 18*s.* 10½*d.* upon his year's earnings of 109*l.* 8*s.* 9*d.* The next year was still more prosperous; the shareholders receiving 13 per cent., and the bonus to labour amounting to 10 per cent. Fully 80 per cent. of the men had qualified themselves for the second year's bonus."

Mr. Archibald Briggs says, "all parties interested are perfectly satisfied with the results obtained, since we inaugurated the system in 1865. Directors and shareholders, managers and workmen, are all content; and, I believe, no one would on any account wish to go back to the old system of jealousy and antagonism."

The new contract, as industrial partnership has been called, has not met with universal acceptance. There are men incapable of belief in anything fresh. The idea of any arrangement between master and man differing, however slightly, from the conventional method, strikes them with dismay; and, without the slightest examination, the thing is at once pronounced wild and visionary. "Utopian" is a convenient phrase with which to brand anything new that runs counter to our prejudices. Accordingly, these partnerships of industry and capital are, with a certain class, Utopian. But if, as experience shows, the plan will prevent strikes and lock-outs, substitute harmony and peace for strife and discord, heal up long festering wounds, remove the sense

of injustice from the mind of the worker, and add to his dignity as a man, bridge over the social chasm which separates him from his employer, give him new incentives for labour and prudence, and withal, at the same time add to the emoluments both of master and man; then let us hope that many such Utopias will arise.

And now we approach the conclusion of our pleasant task. On every side we find evidence, more or less strong, of a sense of responsibility on the part of employers such as was formerly entirely wanting. The details we have given will show that at least a leaven of the employer class are anxious to fulfil the duties of their station, to appreciate the opportunities which their position gives them of adding to the happiness, and even virtue, of their fellow men. Truly there is a stirring in the vast valley of dry bones. So much we may say for the moral side of the subject; and, regarding the economical portion, we think there is equal cause for hope.

The cessation of the present disastrous struggle is to be most earnestly desired, and these pages will show that there are signs of industrial relations becoming more satisfactory to both employers and employed. The past is dark, the present but gloomy, but in the future are hopes of better things. The angel of knowledge is flying over the world "with healing in her wings." The people are slowly learning lessons of temperance and pure living. What a change has been effected in this direction in the last half century, and what greater changes may not the next half century bring forth? The future has promise; nay, may we not already say, in contrasting the present with the gloomy past:

"Ecco l'aurora d'un giorno glorioso."

WILLIAM E. A. AXON.

NOTE.—In the preparation of the foregoing article, the following works have been consulted:—'Claims of Labour' [by Arthur Helps]: London, 1844. 'Proceedings of the Co-operative Congress,' edited by J. M. Ludlow: London, 1869. 'Industrial Partnerships, as carried into Practice at the Whitwood Collieries,' by H. C. Briggs: London, 1868. 'The Present Position and Prospects of Partnerships of Industry,' by Edward Owen Greening: Manchester, 1866. 'Heads and Hands in the World of Labour,' by W. G. Blaikie, D.D.: London, 1865. 'Co-operation and Partnerships of Industry; the Future of Labour,' by William E. A. Axon: Manchester, 1866. 'Exposition Universelle de 1867; Rapports du Jury International,' publiés sous la direction de M. Michel Chevalier: Paris 1868. 'Reports on the Paris Universal Exhibition, 1867': London, 1868; Vol. VI. contains the English returns relative to the new order of reward for the most successful attempts at promoting the wellbeing and harmony of those engaged in the same work. 'La Suppression des Grèves par l'Association aux Bénéfices,' par M. Charles Robert: Paris, 1870; this is the most elaborate study that has hitherto appeared on this subject, and we may safely refer to it the reader who wishes to examine the subject further. 'Progress of the Working Classes from 1832 to 1867,' by J. M. Ludlow and Lloyd Jones: London, 1867. 'Children of Lutetia,' by Blanchard Jerrold: London, 1864. 'Une Veritable Cité Ouvrière. Le Familistère de Guise,' par A. Oyon: Paris, 1865. On this subject there are valuable papers by Mr. Geo. Godwin, in 'The Transactions of the National Association for the Promotion of Social Science, 1865'; and by Mr. Tito Pagliardini, in 'The Social Science Review,' 1865. 'Robert Owen, the Founder of Socialism in England,' by Arthur John Booth, M.A.; this excellent work, from which we have taken our details concerning Owen, deals only with his career as a social innovator. A good life of him by W. L. Sargant, F.S.S., has been published some years; but to completely understand the career of Robert Owen a third work is still desirable from the pen of some old professed disciple. 'The Social Question; a Speech delivered by Johann Jacoby at Berlin': Printed for private distribution [by W. F. Cowell Stepney, Esq.], 1870. 'Socialismo y Sentido Comun,' por L. B. Bougeau: Guadalajara, 1852. 'Les Associations Ouvrières en Angleterre' [par L. P. A. d'Orléans, Comte de Paris]: Paris, 1869.

SUMMIT RAILWAYS AND MAIL ROUTES.

Every year witnesses an extension of the means of transit along the great highways of the world, by the aid of railways and steamers. The necessity for this extension is not great in regard to messages or verbal communications: seeing that the land wires and submarine cables of the electric telegraph companies are bringing all nations virtually into close vicinity so far as regards this class of correspondence; but actual travel, and the transmission of letters by post, call for unceasing activity on the part of inventors, engineers, shipbuilders, and capitalists. Difficulties must be met, obstacles removed, resistances overcome; mountains must be crossed by the locomotive, and oceans conquered by the paddle or the screw—all opposing forces must be subdued, in order that ready access may be obtained from one part of the world to another. Such seems to be the sentiment or conviction pervading the minds of all, and urging men to the adoption of new schemes having this object in view.

The Suez Route.

In the 'Companion to the Almanac' for 1870 an account was given of a great undertaking which had been many years in hand, viz., the Suez Canal. It is already evident that this canal will work a revolution in ocean traffic. The Peninsular and Oriental Steam Ship Company may or may not make use of the canal instead of the railway, across the Isthmus; the Canal Company may or may not reap an adequate net profit on the vast expenditure incurred, and on the probable heavy annual outlay for repairs; but it is certain that new channels of commerce have been opened through the medium of the Suez Canal. Russian vessels from the northern and western shores of the Black Sea, Turkish vessels from Smyrna and Constantinople, Austrian vessels from Trieste, Italian vessels from numerous ports, French vessels from Marseilles and Toulon, Spanish vessels from Cadiz and Barcelona,—all now pass through the Canal, to obtain a share of the commerce which the Red Sea and the Indian Ocean afford; while Liverpool is actively engaged in organising fleets of merchant steamers, expressly constructed to make voyages from that port to India and China *viâ* the Suez Canal, without making the lengthened détour round the Cape of Good Hope. It still remains a question not quite settled in what position the Canal and its owners would be placed in the event of a war affecting Turkey, Egypt, or India.

With a Mercator chart before us, we see that there are many new channels of communication waiting to be opened, as soon as engineering skill and financial enterprise have been brought to bear upon them. Mountain ridges still block the way, isthmuses are still unpierced, at spots which will by-and-by supply short cuts from one part of the world to another. Much remains to be done; but it is equally true that much has been done, irrespective of, or superadded to, the Suez Canal.

The Rocky Mountains Railway.

When we consider the position which the great continent of America occupies, washed by the Atlantic on its eastern shore for 9000 miles, and by the Pacific on its western shore for an equal distance, we need not wonder that commercial men should wish to connect the two shores by railway. True, this was done many years ago by the Panama line, at the narrowest part of the American continent; but such a channel could be of only limited utility. In the first place, the Isthmus belongs neither to England nor to the United States; in the second place, it is too far south to meet the requirements of North American commerce; and in the third place, it cannot develope the wonderful internal riches which are met with in the Colorado and Sacramento regions. Hence the resolute determination of the Americans, during the last twenty years or so, to drive a path for the locomotive across the whole breadth of their territories.

The construction of this great highway across the Rocky Mountains, to complete a route from the Atlantic to the Pacific, was due partly to conquest, partly to gold discoveries. In 1848, the United States obtained, as the result of the war with Mexico, the cession of the three great provinces of New Mexico, Arizona, and California; thereby carrying the territories of the great republic to the shores of the Pacific. In the very next year, the gold discoveries at California took place. Hence a double motive for constructing a railway from ocean to ocean —to develop the resources of the country, and to afford a channel of transit for the gold diggers. The inevitable costliness of any such undertaking led to some years delay for discussion, and a much longer time for actual examination. Railways already existed from New York and Philadelphia to the Mississippi; and in 1853 the American Government issued orders for a thorough examination of the vast country beyond the great river. Speaking roundly, the direct distance may be taken at 3000 miles from ocean to ocean, divided into three nearly equal portions of 1000 miles each by the Mississippi and the Rocky Mountains. So immense were the difficulties to be encountered, in traversing bleak mountains and sterile plains, and in encountering hostile Indians, that the explorations were not completed until 1857, and the results embodied in thirteen bulky volumes. The Government recommended that, out of five routes examined, the southernmost should be adopted, crossing the Rocky Mountains at about lat. 32° N. at an elevation of only 4000 feet above the level of the sea. The Slavery question, the Civil War, and the rivalry between the great cities of Chicago and St. Louis, brought new elements into the struggle; until at length, in 1862, the American legislature finally decided on a railway which would cross the Rocky Mountains at a point much further north, about lat. 41°. The work was to be done by two companies, the Union Pacific and the Central Pacific, the two portions meeting somewhere near the Great Salt Lake of the Mormons; the Government were to advance about two-fifths of the necessary capital at 6 per cent., to be repaid in a certain number of years; and the companies were to have an absolute gift of

a large area of national land, forming a strip about 10 miles wide from end to end of the railway.

The difficulties of constructing this railway have been very great. From New York to Chicago on Lake Michigan, and thence to the Missouri, had already been finished; and for 150 miles beyond Omaha on the Missouri all was easy enough. But there the troubles began. Nearly 400 miles of railway run through a country so barren that it can scarcely support a covering of meagre grass; hardly a tree can be seen, and the soil is of a rough sandy character. Then the line gradually climbs the Black Hills to the dividing ridge, at an elevation of 8262 feet; after which it crosses the lofty plateau of Laramie Plains, which yield pasturage, but very little else. Next comes a belt of elevated country, 200 miles wide, with rugged, barren soil and bitter water in the streams. After passing the Great Salt Lake, the line enters the Great Basin, a region as large as France, almost a desert in regard to agricultural resources, but rich in silver mines. Then comes the ascent of the Sierra Nevada, 1176 feet in 14 miles; and the descent of the same range, 4594 feet in 51 miles. Lastly, there is a continuous descent, of an easier character, to Sacramento and San Francisco in California.

It was not the gradients nor the curves, the tunnels nor the viaducts, that rendered this long line of railway difficult to construct; it was the conveyance of men and materials to and through regions inhabited almost solely by the Indian and the buffalo, and producing scarcely any articles of food. The Union Company, beginning from the east, brought all their men and materials from the Missouri; the Central Company, beginning from the west, made San Francisco their source of supply. It was to the west of the Great Salt Lake, over the Sierra Nevada, that the difficulties were most trying. The Central Company had 10,000 Chinamen at work here. More than 3000 ox-teams dragged the materials for the rail hundreds of miles, up mountain sides, through ravines, across desert plains. The Chinamen (who worked well and steadily at comparatively low wages) went on first, making the tunnels, cuttings, and embankments; and then came long trains of bullock-sledges, laden with rails, ties, spikes, bolts, and chairs, to form the permanent way: more than 250 tons of such material being required for every mile of rail. Some of the work was done amid the snow-storms of winter, on elevated plateaus and mountain-passes. During a distance of 1600 miles, wood for ties or sleepers could be obtained at only three points accessible to the road. The organisation of the force engaged on the works was semi-military. First went an advance guard of surveyors and engineers, settling about the exact levels, gradients, and curves; then the central body, to execute all the cuttings, embankings, tunnelling, and bridge building; and then the rear corps, to place the sleepers, lay the track, spike down the rails, perfect the alignment, and trim the ballasting. The way in which the men worked on from the finished to the unfinished portions of rail afforded as good an illustration as could be found of the "go-ahead" activity of the Western Republicans. "The advanced limit of the rail is occupied by a train of long box-cars, with hammocks

swung under them, beds spread on top of them, bunks built within them, in which the sturdy, broad-shouldered pioneers of the great iron highway sleep at night and take their meals. Close behind this train come loads of ties, rails, spikes, &c., which are being thundered off upon the roadside, to be ready for the track-layers." How quickly the work was done when the track-layers and the material were ready at hand, we see from the following description: "On they come. A light car, drawn by a single horse, gallops up to the front with its load of rails. Two men seize the end of a rail and start forward, the rest of the gang taking hold by twos until it is clear of the car. They come forward at a run. At the word of command the rail is dropped in its place, right side up, with care; while the same process goes on at the other side of the car. Less than thirty seconds to a rail for each gang; and so four rails go down to the minute. The moment the car is empty, it is tipped over on the side of the track to let the next loaded car pass it, and then it is tipped back again; and it is a sight to see it flying back for another load, propelled by a horse at full gallop at the end of sixty or eighty feet of rope. Close behind the first gang come the gaugers, spikers, and bolters; and a lively time they make of it. It is a grand Anvil Chorus that those sturdy sledges are playing. It is in triple time, three strokes to a spike."—(Bell, 'New Tracks in North America.')

There is upon this remarkable railway the longest shed in the world, the longest space covered in by a roof. To protect the line near the summit from the avalanches and snow-drifts of winter, the engineers resolved to roof it in for upwards of forty miles. They selected bulky trunks of pine trees and braced them against the mountain slopes, framing and interlacing them with beams. They sloped the roof, sustained by massive timbers, and stayed by braces let into the rock and covered with heavy planking up against the precipices, in such a way that descending earth or snow would be shot clear over the safely-housed track into the depths below. The trains are protected from snow even in the most snowy region. There is, however, this inconvenience connected with the arrangement, that daylight is so nearly shut out as to convert the forty miles of distance virtually into a tunnel.

This Rocky Mountains railway is finished and opened, and trains do the 3000 miles or so of distance in about eight days. If we picture to ourselves a body of passengers worn out with the fatigue of excessive travelling, we must remember that English railway carriages afford us scarcely any idea of the comfort now provided in America. One of Pullman's Dining Cars, such as form integral parts of the trains on the Rocky Mountains line, is so large, so complete, so well arranged, that forty-eight passengers can sit down to dine in it at once, with a kitchen, a pantry, a staff of servants, and a store of provisions at hand; while each of the Sleeping-Cars has an amount of bed-room and dressing-room accommodation for which weary bones on English railways would be warmly grateful. The dining, the lounging, the smoking, the reading, the washing, the sleeping—all are going on while the train is doing its thirty miles an hour; insomuch that the train is a veritable travelling hotel.

There is reason to believe that this particular route across the Rocky Mountains is not the best that might have been selected; and that another, if not two others, will be constructed as the traffic of the interior develops itself. Recently (August 1870), a railway of 150 miles was finished from the extreme navigable northern point of the Missouri to the extreme western point of Lake Superior; from this last-named point, a line of 270 miles to Red River will be finished and opened in 1871; and from thence a railway will gradually be formed across the (recently) fur hunting country to the Pacific. Further south, the Kansas Pacific Railway has been opened as far as Denver (September 1870); this will be an integral portion of another line across the Rocky Mountains. For some few years to come, however, there will not be a second complete and distinct line of rail from ocean to ocean.

This great railway across the greatest breadth of North America (3000 miles in round numbers, but really 3300 from New York to San Francisco), is not likely to be of much advantage to England in regard to her intercourse with India; because the Suez route, whether the rail or the canal be taken, is both quicker and cheaper; while the Cape of Good Hope route is cheaper if not quicker. From England to China, the time of transit by San Francisco is about equal to that *viâ* Suez; but as goods' conveyance by the great railway will necessarily be expensive, the present routes will continue to be those most used. From England to Japan, and from England to New Zealand, the advantage in time of journeying will be in favour of the San Francisco route. In regard to our very important Australian colonies, and the two great routes here named, the time is about equal; and it is not improbable that we shall see a healthy competition maintained in this quarter. Concerning the whole western coast of America, from Sitka in the north to Valparaiso in the south, the future will show which is the better route from Europe—by Panama or by Salt Lake. The first mail journey from England to Australia by this new American route was completed on the 17th of May, 1870; exactly two months from Liverpool to Sydney, including stoppages during the Pacific voyage at Sandwich Islands and New Zealand; but the arrangements were imperfect; the time will be materially shortened when the system gets into good working order.

The Mont Cenis Summit and Tunnel Railways.

On transferring our attention from the New to the Old Continent, we become at once sensible of the fact that there is a mountain barrier which separates Italy from the other parts of Europe, thereby cutting off ready communication from Northern Europe to that beautiful country, and to the Mediterranean ports which open a path to Egypt and the East. True, there is a tract of comparatively low land near the sea shore, affording a means of travel from Southern France to Northern Italy; but this is of very little use to other parts of Europe, situated north of the great chain, and having need of travel to southern regions. The conquest of the Alps by the locomotive is, however, becoming gradually achieved. This formidable mountain barrier is

ceasing to be an obstructive boundary between Cisalpine and Transalpine Europe. The Alps are crossed by several pack-horse and carriage roads, running through the passes between the loftier peaks; and several of these have lately engaged the attention of engineers, with a view of determining the possibility of carrying railways over the same passes. Already the railways of France, Switzerland, Bavaria, the Tyrol, Austria, and Italy, come to the foot of the Alps, and the great mountains will not be allowed to remain permanently a bar to international travel.

The Mont Cenis Tunnel Railway.—In 1852, Chevalier Mans made public a plan for constructing a great tunnel through Mont Cenis, to connect the French railways with those of Savoy and Piedmont. His part in the project was, not to construct the line, but to bring into use a machine which he had invented for excavating the very long tunnel that would be necessary. The plan fell to the ground for four years; but in 1856 another tunnelling machine was tried at Geneva, invented by MM. Grandis, Grattoni, and Sommeiller. It was known that if the Alps were tunnelled anywhere near Mont Cenis, the tunnel must be nearly eight miles in length, and excavated through very hard rock; consequently, that it would be almost endless work to construct it by the ordinary mode. The experiment at Geneva being successful, the French and Italian Governments resolved to construct the proposed railway, and to share the cost between them. The line was not to follow the existing road over the pass of Mont Cenis, but was to save many miles of distance by taking a short cut more to the south-west. Near Fourneaux, a village on the French side of the Alps, the mouth of the tunnel was to commence; while the southern or Italian mouth was to be at Bardonnêche, about 20 miles from the railway at Susa. As the one village is 3445 feet above the level of the sea, the other 4225 feet, there was an ascent of 780 feet to be provided for in one way or other. It was determined to lay out the tunnel in two inclines, each descending from a summit level near the centre, but with a sharper descent on the northern side than on the southern. As there would be a great height of mountain over the tunnel (at one place as much as 5251 feet), it was impossible to construct shafts either for working or ventilation, and therefore the works could be carried on from the two ends only. The tunnel itself, when finished, will be 12,220 mètres long, equal to 13,365 yards, or about $7\frac{3}{5}$ miles. The gradients are ascending for 5583 yards on the French side, and descending for 7781 yards on the Italian side. The junction of the northern end of the tunnel with the French lines of railway will be comparatively easy; but that of the southern end with the Italian lines will involve 25 miles of very formidable work, including gradients varying from 1 in 50 to 1 in 77, nineteen tunnels, and fifteen viaducts.

The plan having thus been formed, and the levels carefully taken, the works were commenced; but so long a time was consumed in preliminary labours, that the machines did not regularly commence work until 1861. The tunnel is $26\frac{1}{4}$ feet wide by $19\frac{2}{5}$ feet high, and will have two lines of rail running through its whole length. Two-thirds of the excavation are in schist; another portion in limestone,

more difficult to work; and the rest in very hard quartz, the cutting of which absorbs time and labour to a serious extent.

The machinery for the perforating is at once vast and beautiful. A large reservoir, placed at some height above the mouth of the tunnel, collects rain and stream water, and sends it down an incline through ten large iron pipes to a lower level; this descent supplies the power by which most of the operations are carried on, a water-pressure equal to 26 feet perpendicular. In a building near the mouth of the tunnel are ten *compressors*, or air-compressing machines, two engines called *aerometers*, and several very large receivers. The action of the water pressure on the two aerometers sets the ten compressors to work; the compressors condense atmospheric air with a pressure of 96 lbs. on the square inch, and force it into the receivers; and then the condensed air works the excavating machines, through strong iron pipes 8 inches in diameter. The excavating or boring machine does not make the whole of the tunnel; it excavates a sectional area 12 feet broad by 8 feet high, leaving the rest to be wrought out by hand. The machine is upon wheels, which run along a tramway. It consists of a frame on which are mounted ten *perforators*, each susceptible of being moved in various directions, and provided with two flexible tubes, one to bring compressed air, and the other water. Jumpers or boring-tools dart out through pipes in front of the perforators, and dash against the hard rock; each jumper receives a rapid to-and-fro motion by a peculiar management of the compressed air, and each makes its own hole in the rock, independently of the others. In moderately hard rock, such as limestone, the piercing goes on at the rate of about a yard an hour. When about eighty holes have thus been driven, the jumpers and the compressed air are put out of gear, and water is driven through the other tube, to clear out the *débris*, and to allow the end of each jumper to cool. Then comes the blasting (for the machine does not actually excavate the tunnel; it merely bores the holes into which the blasting powder is placed); the blast brings down far more of the rock than the tools grind away by boring. The holes are charged with powder and fusee; the machine is withdrawn to a safe distance; massive folding doors are closed in front of it; a match is applied, an explosion takes place, and the rock between the holes is riven to fragments. A blast of compressed air is then sent in to clear away the smoke; and miners, with their picks, finish off the work which the blasting had begun. The holes are mostly driven about 27 inches deep; insomuch that there is one blasting to every three-quarters of a yard of tunnel. Each jumper gives three blows per second, under an impulse of about 180 lbs., and makes $\frac{1}{18}$th of a revolution on its axis at or after each blow, so as to effect a kind of grinding as well as cooling action. A jumper is worn out very quickly under this severe ordeal, requiring renewal at every six or seven yards of working. When tunnelling veins of hard quartz, the points are often broken after a few blows. At the Italian end of the tunnel a descending stream of water is made to work the compressing machines, as here described; but at the French end it has been found better to employ a water-wheel moved by the River Arc. This tunnelling machine has thus been described

somewhat minutely, on account of its remarkable construction and effective process.

Day and night have the Mont Cenis machines been at work since the year 1861, with the exception of a few intervals for repairs. The excavating really began in 1857, by hand and by various experimental processes; but the perfected machine did not set regularly to work till four years later. The progress in the great work of excavation has been at the following rate (the reader can easily convert these quantities into miles or yards by remembering that while 1760 yards make a mile, there are only 1609 mètres in a mile; in other words, a mètre equals about 3 ft. $3\frac{1}{3}$ in; or 10 mètres are a trifle less than 11 yards.):

Year.	Italian End. Mètres.	French End. Mètres.	Total. Mètres.
1857–8	285	213	498
1859	236	133	369
1860	204	140	344
1861	170	193	363
1862	380	243	623
1863	426	376	802
1864	621	467	1088
1865	764	458	1222
1866	813	212	1025
1867	825	687	1512

There being some discrepancies in the figures for the next two years, in regard to the two sections of the tunnel, we will not state the quantities; but it will suffice to say that, on the 1st of January, 1870, the length of driftway excavated by the machines had reached the amount of 10,598 mètres, of which 10,050 mètres had been worked out to the full size. Five months afterwards (end of May 1870) the driftway had extended to 11,370 mètres, and the full-size tunnel nearly as far. This makes so near an approach to 12,220 mètres, the total length required, that the engineers expect to bring the tunnel to a completion in 1871. If the very heavy works between the Italian end of the tunnel and the commencement of the Italian railways at Susa are finished at the same time, through traffic from France may at once commence.

The Mont Cenis Summit Railway.—Such will, eventually, be the truly grand tunnel through Mont Cenis. But now we have to notice a subsidiary scheme. As it was known that the tunnel would require many years to excavate, a plan was proposed for constructing a temporary railway *over* the Mont Cenis Pass, without any tunnel at all. If such a railway were estimated to cost anything like the English average per mile, no such plan would have been adopted in addition to the cost of the great tunnel for the permanent railway; but modern inventions came to the aid of the projectors. The existing coach-road, from St. Michel on the French side of the Alps to Susa on the Italian side, is 48 miles long, crossing the ridge at the Pass of Mont Cenis. Goods and passengers were shifted from the rail at St. Michel into waggons and diligences, and then transferred again to the rail at Susa. The problem was started—could rails be laid down on this selfsame coach-road, and could the locomotive climb such an ascent? It is known that railways, in many parts of the world, now

present gradients which would certainly have been avoided as impracticable in the earlier years of the system. Throughout the distance from St. Michel to Susa the gradients average 1 in 25, but some parts of it are as steep as 1 in 12; too formidable to be trusted to ordinary locomotive traction. Such being the conditions which had to be fulfilled, engineers sought for means of meeting them; and Mr. Brunlees has succeeded in the search. As a means of making the wheels of locomotives and carriages bite the rails so as to ascend steep inclines without slipping, a third or centre-rail was tried many years ago; and Mr. Fell, by a series of experiments on the High Peak Railway of Derbyshire in 1861 and 1862, brought this plan to such completeness as to warrant its introduction on the Mont Cenis line. The project thereupon assumed a definite shape. A company, mostly of English shareholders, provided the capital, while the French and Italian Governments gave up half the width of the existing road, on certain conditions as to traffic arrangements, eventual proprietorship, &c. Mr. Brunlees was appointed engineer, and Messrs. Brassey contractors. A preliminary trial was made in 1865 on 1¼ miles of the steepest part of the ascent. The bottom of the incline was 5322 feet above the level of the sea, the top was 5815 feet; this ascent of 493 feet being about 1 in 13. Some of the curves, too, were purposely selected very sharp. With a centre rail and a locomotive made specially for the purpose, trains were safely carried up and down this steep incline. The success encouraged the company to proceed with the whole 48 miles of line.

This Summit Railway (for so it is called) is very narrow, only 3 ft. 7½ in. gauge, 13 inches less than the usual English gauge, and little more than half of our broad gauge. The rails are of the ordinary kind; but midway between them, and elevated about 7 inches above them, is a centre rail having a different section. It is the pressure of horizontal wheels against the *sides* of this rail that gives the bite, superadded to the ordinary pressure on the other rails. The works are mostly very light, seeing that the rails are laid on a pre-existing road, with very little either of cutting or embanking. When the railway was about half finished, in September 1866, a heavy flood in the River Arc carried away walls, bridges, and other works to a considerable extent—not on the higher parts of the road, but in the valley near the junction with the French main line of railway at St. Michel. Although a locomotive passed experimentally over the ridge in August 1867, it was not until June 1868 that the various difficulties were surmounted, and public traffic really commenced. The gradients on the French side of the summit vary from 1 in 30 to 1 in 12; those on the Italian side vary from 1 in 16 to 1 in 11. The centre rail is laid only on those parts where the gradient is steeper than 1 in 25; the unassisted locomotive being credited with power enough to drag up a train in the usual way over any less severe gradient. The gradients and curves are so arranged that the steepest inclines occur in the straightest places, the sharpest curves at the easiest slopes. So sudden are some of the curves that, at one spot on the Italian side, one mile of direct route causes five miles of zigzag, surmounting in that space a height of 1700 feet. The railway is open

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overhead for 39 miles out of the 48; 3 miles are covered with a light wooden roof, to protect from slight snowdrifts; 4 miles are strongly roofed with timber and iron, where heavier snow is likely to accumulate; while the remaining 2 miles are under a regularly-built arch of masonry, strong enough to resist avalanches.

Great difficulty has been met with in devising a form of locomotive adapted for the peculiar requirements of this railway, due partly to the narrowness of the gauge, and partly to the nicety required in the pressure against the centre rail. After many trials, a form of engine was adopted which could master all the ascents. It overhangs its supports greatly on all sides; although 20½ feet long, there is a distance of only 7¼ feet between the fore and hind axles; and although the full width is 7½ feet, the wheels rest and run upon the extremely small 3 ft. 7½ in. gauge. The weight of the engine, with fuel and water, is 22 tons. The wheels, both vertical and horizontal, are 2 ft. 4 in. in diameter. The horizontal wheels are so pivoted as to press against the sides of the centre rail, with a provision for varying the degree of pressure. The passenger-carriages are somewhat like London omnibuses, but with a door at each end; they are provided with horizontal grip-wheels, like that of the engine. The interior fittings differ for the different classes, but in all alike the passengers sit sidewise—in omnibus fashion. The windows cannot be opened—a safeguard against accidents to incautious passengers on a railway often bounded on one side by rocky walls, and on the other by gaping precipices. About one half the width of the original coach-road (the outer half) is appropriated to the railway, the other half being left for ordinary road traffic.

This Mont Cenis Summit Railway was opened for traffic on the 15th of June, 1858. A train started from the Italian line at Susa, went over the Pass, and joined the French line at St. Michel, doing the distance of 48 miles in six hours less than the former diligence. In August of the same year a landslip occurred on the Italian side, which wrought great destruction; and much time was lost before the traffic could be renewed. The winters of 1868–69 and 1869–70 furnished evidence that snow-drifts and avalanches will be frequent sources of difficulty to this railway, and that the line is not fitted to be a regular mail and passenger route in all weathers; but even when the great tunnel route is opened, the possession of this alternative route will be valuable. The total cost has been about 8000*l.* per mile, exclusive of royalties and interest during construction.

Completed and Projected Alpine Railways.

But Mont Cenis is not the only spot on the Alps conquered by the locomotive. Two others of the mountain passes have now been brought into the railway system of Europe; and four more are, as schemes, competing for the favour of governments and capitalists. The Alps, as is well known, bend round in a sort of crescent or semicircle, having its terminal points near the shores of the Gulf of Genoa and the Adriatic, and its centre arching up into Switzerland. Of the passes, or practicable routes between the loftier peaks, those suitable for pack-horses are many: those broad and level enough for actual

carriages are, of course, fewer; and it is only among the latter that railway engineers have made their surveys and researches. One of these passes, that of Mont Cenis, has just engaged our attention. It will suffice to notice very briefly six others, in so far as they are, or put forth claims to be, connected with the railway systems of Europe. These are, the *Sömmering*, the *Brenner*, the *Lukmanier*, the *Splügen*, the *St. Gothard*, and the *Simplon*, the names of the routes being derived from the names of the passes.

The Sömmering Route.—Of the several Alpine passes, the portals into Italy, traversed, or at all likely to be traversed, by railway, the most eastern is the *Sömmering*, connecting Austria with Italy. This line has been finished and opened ever since 1854. Engineers and politicians have alike stated that a better and cheaper line could have been constructed somewhat further eastward; but it was rejected, because it would favour and strengthen Hungary rather more than was palatable to Austrian policy at that time. Commencing at Vienna, the railway strikes nearly southward to Wiener Neustadt, and then south-west to the Sömmering, towards which it rises 1325 feet in 13¼ miles. The line is, therefore, anything but a steep one; but this easy gradient has been obtained at the expense of very heavy works in tunnels, galleries, viaducts, bridges, embankments, and cuttings. Entering Styria at the Sömmering, it passes by Brück and Glatz to Töplitz, near which place it enters Carniola, and passes thence by Laybach to Trieste, on the shores of the Adriatic. Here the railway is connected with other lines which touch at or near Pavia, Treviso, and Venice, and so on to Vicenza, Verona, &c., to all the great cities of Italy. This is strictly an Austrian entrance into Italy, politically important at the time when Lombardy and Venice belonged to Austria, and likely to be commercially important at all times.

The Brenner Route.—This may be regarded as the route from Bavaria and the Tyrol into Italy. When, in 1867, the railways of Bavaria were extended 66 miles from Rosenheim to Innsbruck, they fairly carried the European network into the Tyrol. About the same time, 9½ miles of rail were completed from Botzen to Verona. All that was then wanted to finish the linking of the Bavarian and Tyrolean railways with those of Italy was a line of 77 miles from Innsbruck to Botzen, over the Brenner Pass. Innsbruck is 1899 feet above the level of the sea; the Brenner is 4484 feet. By adopting very heavy works, similar in character to those of the Sömmering line, the gradients were kept within 1 in 40—a remarkably level line for such a country. The ascent begins at Bolsano. There are 27 tunnels, the longest 1500 yards. The summit is marked by two small streams; one, the Eisach, which joins the Inn, and thereby becomes an affluent of the Danube; the other, the Siller, which descends to the Adige, and finds an outlet into the Adriatic. The works of this mountain railway (which cost 3,000,000*l.*) were in progress from March 1864 till August 1867, when they were completed.

The Lukmanier Route.—There has been a competition between the advocates of four different routes across the Alps westward of the

Brenner and eastward of Mont Cenis: viz., the Lukmanier, the Splügen, the Simplon, and the St. Gothard. All alike would connect Switzerland with Italy by rail; and something can be said in favour of each as compared with the others. The Lukmanier would be easier to construct than any of the other three, with a summit 600 feet lower than that of the St. Gothard; but its commercial advantages would be so much less, that the scheme has gone out of favour.

The Splügen Route.—This, like the Lukmanier, would probably be easier to construct than the Simplon or the St. Gothard; but, like it also, the connections north and south are not favourable to the development of a large commerce.

The St. Gothard Route.—The Pass of St. Gothard is near the upper waters of the Rhine in Switzerland, and those of the Ticino in Italy, and is temptingly placed for a main channel of communication between the two. The summit level would be 6443 feet above the level of the sea. There would have to be constructed about 125 miles of railway, to connect the Swiss with the Italian lines over the pass. The northern cantons of Switzerland advocate this route, as it lies directly in their highway to Italy; and they point to the fact that it would establish an alternative route from Paris to Piacenza (where the principal railways of northern Italy meet) quite as short as that *viâ* Mont Cenis. After a long series of discussions, an agreement has been arrived at for the construction of this railway. The work is to be entrusted to a company, who are to have nine years to complete it, and are to receive a subvention of 85,000,000 francs (3,400,000*l.*), of which the Italian Government is to provide 45,000,000, the Swiss Government 20,000,000, and various German States the remainder. In May 1870, negotiations were in progress between Italy, Switzerland, South Germany, and North Germany (virtually Prussia) to settle the exact route to be taken, the exact contributions of the several governments, and the mode in which the traffic shall be developed when the line is finished. War has temporarily interrupted the scheme, but there is no reason to believe that the check will be other than temporary. The cost of the work, with numerous additional links of connection with existing lines of railway, is now set down at 6,800,000*l.* Besides opening up the only direct communication between the Rhine and the Ticino—i.e., between Central Germany and Central Lombardy—this St. Gothard line will render England and Italy independent of France as regards the transmission of our overland mail. From Ostend to Cologne, Basle, Lucerne, across the St. Gothard, and through Italy to Brindisi, not a yard will be through French territory. Not that there is any particular reason for England to prefer this route, especially as the route *viâ* Mont Cenis will be ready so much sooner, and is a little shorter; but it will be very advantageous to have two routes, in case war should close either of them against us. At any rate, Central Germany and Switzerland will be certain to develop a large traffic with Italy, irrespective of England altogether.

The Simplon Route.—This scheme has many supporters, and may be regarded as a rival to the Mont Cenis on the one hand and the St. Gothard on the other. It would certainly well accommodate the

passage from the east of France, through the western cantons of Switzerland, into Italy. The summit level would be 6174 feet, 269 feet lower than that of the St. Gothard; and it would require the construction of about 75 miles of new railway. From Paris to Piacenza would be 616 miles by Mont Cenis, 597 by the Simplon, and 599 by St. Gothard. Taking Turin, Genoa, Alessandria, and Piacenza as four points of destination, the three routes would in like manner not be very far from equal in length, each having the advantage for one or two of the towns. The route to be followed by the Simplon railway will be by way of Sion, Sierre, Brieg, over the Simplon Pass, and then to join the existing Italian railways at Domo d'Ossola. The line from Paris would pass by the Lake of Geneva to Sion. No particular difficulties would occur up the valley of the Rhone as far as Brieg; but at this point heavy works would begin. Four plans were examined for crossing the Simplon: First, a tunnel of 10½ miles (nearly 3 miles longer than the great Mont Cenis tunnel), from Gliss in Switzerland to Isella in Italy; secondly, a tunnel of 7½ miles, from Berisal to Algarbi; thirdly, a tunnel of 2½ miles, from Tavernelle to Bernesch; and fourthly, to adopt the present carriage road, with a three-line rail on the Fell system, having a maximum gradient of 1 in 15. As may easily be supposed, the schemes for the shortest tunnels would involve the largest amount of open-air work in the form of cuttings, embankments, and viaducts. On the Italian side, from Sierre to the base of the Simplon is 23 miles; thence to Domo d'Ossola 44; and a few more miles fill up the railway gap. A company, called the *Compagnie de la Ligne d'Italie par le Simplon*, declared their competency to lay down a "Fell" railway by the Simplon route in two years, if the French, Swiss, and Italian Governments would aid them. There was, however, this difficulty in the way: that, supposing the Simplon line to be made, there would be much Swiss railway still to construct, to connect the eastern end of the Lake of Geneva with the railways of France. Very likely, if constructed, the Simplon route would be a favourite one for tourists, on account of the beautiful scenery through Western Switzerland; but such a line could not possibly yield profit to a joint-stock company, unless aided by subscriptions or subsidies from the Governments. Circumstances arising out of the war of 1870 will probably cripple the resources of France too greatly to permit her government to subsidise any more Alpine railway schemes just at present; and she may perforce wait to reap a share of the advantages which the Mont Cenis route will by-and-by yield.

Other Mountain Railways.

The Rocky Mountains in America, and the Alps in Europe, though the most important, are not the only mountain chains conquered by the locomotive. That railways on very steep inclines can be worked without a centre rail is now well ascertained; and, indeed, many mountain sides are thus climbed. Some engineers entertain an opinion that the Fell system will eventually be abandoned, partly on account of certain defects inherent in it, but principally on the ground that the locomotive is showing itself more and more equal to the task of drawing

trains up very steep inclines without the aid of a centre rail. It is contended, for instance, that there will be great difficulty in maintaining strict parallelism in the three rails, especially as one of them is elevated several inches above the level of the others. Such objections are, however, conjectural and prospective; to be tested by further experience of the centre-rail system now in operation.

Some steep inclines are surmounted by the aid of cogs and ropes, as well as by that of a centre rail. On the Madison and Indianopolis Railway, in New Hampshire, there is an incline of 1 in 13, rising 400 feet per mile; between the rails is a cog-rack, into the teeth or cogs of which a pinion beneath the locomotive works, thereby preventing any tendency to slip backwards. On the San Paolo Railway, in Brazil, there is an incline so steep as to rise 2550 feet in 5 miles, 510 feet per mile, or 1 in 10. This severe gradient is divided into four lifts of about a mile each, with short level portions between them. There are stationary engines and ropes, with a peculiar arrangement of rails and passing places. The ropes, 3½ inches in diameter, are made of steel wire. As the down traffic on the line is a little heavier than the up, the descending train in most cases pulls up the ascending; but the engines alone are able to drag up 2000 tons of merchandise per day. In order to avert accident in the event of the snapping of a rope, a special rail is laid down, with a clip break; this has been tried while a train was going eight miles an hour, and has succeeded in stopping it in a very few yards. There is a railway to the summit of Mount Washington, in New Hampshire, which has a slope more like that of the roof of a house than any to which we are accustomed in England. A rise of 3600 feet is effected in a distance of only 2¾ miles, giving a gradient of about 1 in 4. The workmen had to wear shoes studded with sharp spikes while engaged on this incline, and could work only with extreme slowness. There are three rails, the centre one cogged to correspond with teeth in a centre driving-wheel. The train consists of a locomotive, tender, and one carriage for fifty passengers. The boiler of the locomotive is so suspended as always to maintain a horizontal position, and the engine pushes the carriage before it, to prevent disaster by the breaking of coupling chains. The tender and carriage have each a toothed driving-wheel, similar to that of the engine. There is a peculiar system of friction-rollers at the edges or sides of the middle rail, and an ample supply of breaks to stop the train and to prevent it from slipping or escaping down hill.

The first steps have been taken (1870) towards an enterprise of this kind in South America. M. Rosetti, employed by the Government of the Argentine Provinces, has surveyed a line of railway across that continent, beginning on the Atlantic, near Buenos Ayres, crossing the Andes, and reaching the Pacific in Chili. The gradients are not very severe; the time of construction is estimated at four years; the length 1650 miles; and the cost 32 million dollars.

The problem which civil engineers are desirous of solving is—what steepness of incline can the locomotive ascend by its own unaided powers, without the adjunct of any centre rail, cogged rack, or rope? Hitherto most long inclines have had moderate gradients. On the Cen-

tral Pacific, or Atlanto-Pacific Railway, described in another page, the ascent of 7042 feet in 105 miles, from California to the Sierra Nevada, seems formidable; but in no part is the gradient really steeper than 1 in 45. There is a railway in Mexico which, beginning near the sea coast at Vera Cruz, rises to an elevation of 7340 feet at the City of Mexico, and 8400 feet at the summit level near San Salvador; it has curves so sharp that in one place it requires 10 miles of line to do 2 miles of direct distance, and bridges over ravines at a height of 359 feet above the stream below; but still the steepest incline rises 3770 feet in 21 miles, or about 1 in 30. The railway from Valparaiso to Santiago, 114 miles in length, remarkable for its curves, viaducts, and tunnels, rises 2642 feet in 12 miles, equal to about 1 in 24. The Bhore Ghaut incline, on the Great Indian Peninsular Railway—one among the lines celebrated for the tremendous mountain precipices around which it is carried by means of tunnels, viaducts, embankments, overhanging galleries, and sharp curves—rises by a comparatively easy gradient of 1831 feet in 16 miles. The summit level of many railways is at a great height above the level of the sea; such as the Baltimore and Ohio, 2626 feet; the Sömmering, 2887 feet; the Madras and Bangalore, 3000 feet; the Alar-del-rey and Santander, 3525 feet; the Western Railway of New South Wales, 3636 feet; the Mont Cenis Tunnel Line, 4230 feet; the Copiapo in Chili, 4470 feet; the Mont Cenis Summit Line, 6870 feet; the Atlanto-Pacific at the Rocky Mountains, 8242 feet; the Vera Cruz and Salvador, 8400 feet; but then these lofty summit levels tell nothing concerning the gradients by which they are achieved, unless the length of rail in miles is also named. Of actual steep inclines ascended by the locomotive without the aid of ropes or centre rails, the following may be taken as illustrative examples:—First, the Blue Ridge Mountains of Virginia are crossed by a railway having a gradient of 1 in 18, rising 1885 feet by its means. Secondly, the High Peak Railway, as already mentioned, presents an instance of a train ascending 1 in 12. Thirdly, at the Whitehaven Mines a locomotive, specially made for the purpose, draws a load of 22 tons up an incline of 1 in 11. Fourthly, in ironworks near Durham a locomotive drags the ironstone and limestone to the mouth of a smelting furnace up an incline of 1 in 10½. Fifthly, on the Baltimore and Ohio Railway there is an incline of 1 in 10, up which trains of 40 tons are drawn by a locomotive. It is proper to mention here that Mr. Fairlie has invented a locomotive especially for mountain railways; he places the load on the engine itself, or rather places the engine, tank, and a large carriage for sixty or seventy passengers, on a peculiar truck or frame called a *bogie* carriage. The object in view is to get the whole weight of the train to press downwards upon the rails, thereby increasing the bite or grip of the wheels upon them, instead of dragging the carriages after the engine. Mr. Fairlie has expressed an opinion that any gradient on the Mont Cenis Railway might be surmounted by this composite locomotive without the aid of the Fell centre rail.

English Channel Passage.

There is one railway talked about of so peculiar and gigantic a character as to occupy a place quite by itself among the schemes of the day. This is a line from England to France, across the Straits of Dover. Long railway bridges across rivers and estuaries are becoming familiar to engineers, and the inherent difficulties are gradually becoming discounted, so to speak, by those who have to construct them and to pay for them. The principle of tubular construction, shown by Stephenson at the Menai, and by Brunel at the Tamar, has taught engineers many things which they have not failed to bring into practical use; while the lattice-girder principle has been equally fruitful in results. The Tyne and the Tweed have been spanned by remarkable bridges. Runcorn Gap is now crossed by a bridge at a height sufficient to allow vessels of considerable size to pass beneath it. Lancaster Sands, at the north-east margin of Morecambe Bay, have now a railway where the rising tide formerly rendered any kind of travelling rather perilous. Solway Firth is similarly crossed at a point which greatly shortens the distance from Cumberland to the south-west of Scotland. Railway bridges over the Firth of Forth near Edinburgh, and over the Firth of Tay near Dundee, have long ago been planned, and are postponed only on account of monetary difficulties. A bridge over the estuary of the Severn, to connect Bristol with Monmouthshire and South Wales, has occupied the attention of engineers, who have prepared plans and estimates for its construction. On the Continent, in America, and in India, many bridges having vast dimensions have been constructed by railway companies, in some cases remarkable for their loftiness, in others for their length.

In all these instances, it is true, rivers or estuaries have been crossed, not seas or straits; and, therefore, inferences must not be hastily drawn as to the practicability of the one class of works from that of the other. Still there are analogies which an experienced engineer will not neglect to observe. Piers, plate-iron tubes, suspension rods, lattice-girders, all are elements capable of combination in various new modes; and our Hawkshaws and Fowlers, our Brasseys and Kelks, are ready to plan and construct almost anything that our capitalists are willing to pay for.

Concerning the greatest of all schemes of this kind now before the public, whether practicable or not, this at least may be said—that any complete scheme of unbroken overland communication from England to Continental Europe and to Asia involves the construction of a railway from England to France across the English Channel. Year after year experiments are made, and projects brought forward, with this object in view. Can it be done at all? Between what points? By whom? With what capital? Will it pay an adequate return on the cost? All these questions remain in doubt except one. It is agreed that some point near Dover and some point near Calais must mark the termini of the Channel passage, because the Channel is there at its narrowest. Conceding, on another of these five questions, that such a railway *can* be constructed, there still re-

mains unsolved the problem whether it ought to be a tunnel under the sea, a bridge over the sea, or something of an intermediate character.

No less than seventy years ago M. Mathieu made public a scheme for a tunnel from Dover to Calais, through which road-vehicles could travel (there were, of course, no railways in those days); oil lamps were to light the tunnel, and iron shafts reaching high up above the level of the sea were to supply ventilation. But those times, when Europe was generally at war, were not propitious for such schemes. Another Frenchman, M. Favre, detailed a plan for a tunnel that would in some cases be 120 feet below the level of the sea, and would be excavated at the bottom of numerous shafts sunk through the sea and the sea-bed; and through this tunnel railway trains were to be drawn by atmospheric power, to avoid the smoke and sulphur of locomotives. A third Frenchman, M. Gamond, had a scheme still more vast, involving a tunnel with four lines of rail, a station half way across the Channel, an enormous shaft 300 feet deep from above the level of the sea down to the tunnel, a lighthouse and landing-stages at the top of the shaft, and descending approaches on the two shores to connect the English and French railways with the rails running through the tunnel. Nor have English engineers and projectors been wanting in ingenious devices in this direction. Mr. Nicol has proposed to construct a tunnel a little higher in the middle than at the two ends, allowing drainage to flow to the land termini; and to line the tunnel with an iron tube instead of with masonry or brick-work. Mr. Austin proposes that there shall be three tunnels, side by side, at a depth of 60 feet below the bed of the sea. Still more recently, Mr. Hawkshaw, Mr. Brunlees, and Mr. Remington have directed their attention to the examination of various modes of tunnelling the Channel, with the view of adopting some one of them that would possess greater advantages than the rest.

Many engineers, however, deterred by the vast expense and difficulty of constructing a tunnel 20 miles long, and the great depth of descent necessary to reach the two mouths of the tunnel from the existing railways, have directed their attention to the possibility of laying down some kind of railway tube in the water. MM. Franchot and Tessié de Mottray some years ago drew up a scheme for such a tube, the tube to be of cast-iron; but how it was to be constructed and laid down, the projectors did not clearly explain. M. Payerne suggested a mode of forming a smooth and regular causeway at the bottom of the sea, and building upon it a tunnel of masonry or brick. Mr. Winton, Mr. Cowan, Mr. Chalmers, Mr. Zerah Colburn, Mr. Page, Mr. Bateman—all have put forth schemes for a sea-bed tunnel. Mr. Page's plan is this: to build on shore eight double conical iron shafts, that is, circular shafts having an inner and an outer casing, and smaller at the top than at the bottom; to tow these out to eight equidistant spots in the Channel, in a straight line; to sink them to the sea-bed, their tops projecting to a sufficient height above the water; to fill in the space between the inner and outer casing with concrete; to construct the tunnel-tube in quarter-mile lengths on shore; to tow out and sink these lengths in their proper places;

to join the lengths of tubes end to end by the agency of workmen protected by diving-bells; to connect all the shafts with the tube, which they would ventilate; to lay down two lines of railway in the tube; and to build a small lighthouse at the top of every shaft. Mr. Bateman, borrowing a hint from the remarkable shield used by Sir M. I. Brunel in constructing the Thames Tunnel, proposes to build up his tube piecemeal, not on shore, but actually in the water itself. The tube, 17 feet in interior diameter and 4 inches thick, would be put together within a peculiar air-tight chamber at the bottom of the sea; and this chamber would be pushed on from the shore a few feet at a time by hydraulic power as soon as each section of tunnel was completed. No working shafts would be used in this plan; the men would worm their way along the sea-bed from both shores to a meeting point in the middle of the Channel. There has been a scheme proposed by Mr. J. F. Smith, in which the railway tube would actually *float in the sea*, on a level somewhere midway between the sea-bed and the surface of the water! It would be weighted down with mooring-anchors, confined by lateral barriers, and strengthened by cross-ties, in modes which seem to satisfy the judgment of the projector, however far they may be from meeting with general assent.

A gigantic railway bridge 20 miles in length has, of course, not been without its advocates. One proposition has been for an iron tunnel or railway tube, supported at a certain height above the surface of the water by 400 masonry piers, with head-room for ships. Another projector, by adopting a tubular or plate-iron form of construction, expects to reduce the cost of such a bridge very materially. A third would discard a continuous high-level bridge, but would construct pivot or swing sections at certain intervals to allow of the passage of masted ships.

The proposed schemes for carrying railway trains across the English channel have even now not all been enumerated. There is the principle of the floating railway, floating bridge, railway raft, railway ferry—call it which we may. Mr. Chinie has proposed the construction of two lofty towers, at some little distance out at sea on both coasts, connected at their tops with the existing English and French railways by viaducts or embankments. A long broad ship or steam-raft, with rails laid down on deck, would be drawn up in a kind of dock at the foot of (say) the English tower. A railway train, going from London to Dover, would run along the embankment or viaduct to the tower, and would there be lowered by hydraulic machinery to the ship, which would steam away with it across the Channel; at the Calais tower it would be elevated by hydraulic power to the embankment or viaduct, and then run to a junction with the French railways. This sort of scheme has been developed with many variations by sundry engineers and projectors. Mr. Daft, Mr. Grantham, Mr. Bridges Adams, Mr. Galloway, have entered into calculations and speculations as to the best kind of vessel to contain a railway train; but the most fully-developed plan is that of Mr. Fowler, which was described and illustrated with much detail in the early part of 1870. If the plan were carried out, there would

be small but convenient harbours formed on the English and French coasts, at Dover, and at a point between Calais and Boulogne. Curved branches of rail would connect these harbours with the existing railways. The ship or ships employed would be 450 feet long, and 60 feet beam. There would be rails laid down on two different decks, the lower for the reception of a goods train, the upper for a passenger train. The stores, coals, and working machinery would be on either side of the goods train on the lower deck: while the dining and refreshment rooms, saloons, ladies' cabins, officers' rooms, &c., would be on either side of the passenger train on the upper deck. (The locomotives belonging to the trains would not accompany them; English engines would deposit the trains at Dover, while those of the French companies would take them up at Calais.) At high water the passenger deck or platform of the ship would be on a level with the quays of the harbour, enabling the trains to run on and off easily through doors of peculiar construction at the two ends of the ship. At other states of the tide the trains would be lowered from the railway quay to the ship by hydraulic hoists; and after the passenger train had been thus disposed of, a luggage train would descend an incline to the lower deck or platform. All being thus snugly stowed away, the huge ship would steam across the Channel at a speed (according to Mr. Fowler's plans and calculations) of nearly 20 miles an hour; indeed, one hour is named as the duration of the voyage. Arrived at the terminus (somewhere near Andrecelles, between Calais and Boulogne), a reverse series of operations would place the train on the French railways, where another locomotive would speed along with it to Paris or towards Brussels.

The Euphrates Route.

The line of travel denoted by this name remains nearly in the same state as Captain Chesney left it forty years ago. Nothing has been done in the form of railway, although an electric telegraph has been in part established. Scanderoon, at the eastern end of the Mediterranean, is only about 120 miles distant from the upper waters of the Euphrates; and then there is a flat country for about 1000 miles (constituting the ancient Mesopotamia) down to the Persian Gulf. In Chesney's time the railway system had been very little developed, and his idea was to establish steam navigation along the Euphrates as part of a mail route to India. A railway is now advocated instead of a canal, and it could easily be constructed. But it would not pay a joint-stock company without a government subsidy, and the Indian Government at present holds aloof.

Ship Canals.

It will be seen from the foregoing details that, in various parts of the world, works are now in progress which, in addition to others completed and in active use, will greatly improve the means of communication through countries traversed by mountain ridges, and from one country to another. Routes are now opened to the locomotive which were before accessible only by the diligence and the heavy waggon, or in others only by the mule train and the packhorse.

But in addition to this, the wants of the mariner are becoming attended to, in the formation of watery paths where there is now dry land. There are many reasons why sea-transit will always be cheaper for certain kinds of traffic than any transit by land. The ocean belongs to all; there is no permanent way to pay for, none of those costly works to construct which press so heavily on the resources of railway companies, and eat into so large a ratio of the gross earnings. True, the ship itself will wear out, and is subject to much liability of disaster; but so likewise are the engines and carriages belonging to a railway company. More ships are wanted every year by almost every maritime country, notwithstanding that so many short cuts by rail have been established; showing that so far from the latter expelling the former, each develops new sources of traffic for the other.

Amsterdam Ship Canal.—In various parts of the world there is manifested a determination to construct, as at Suez, ship canals, broad and deep enough to accommodate vessels of large size, thereby obviating the necessity of transferring cargo from ships to barges or lighters. Those indefatigable people, the Dutch, are furnishing an example of this kind of energy. The busy commercial city of Amsterdam is so situated, at the south-west corner of the Zuyder Zee, that although it is very near the German Ocean or North Sea, a circuitous voyage must be made northward by Helder and Texel before a ship can reach the open sea. The Dutch have resolved to put an end to this state of things by constructing a broad and deep canal from the city westward direct to the ocean. The English engineer, Mr. Hawkshaw, has undertaken the work. The canal will be about 16 miles long, 197 ft. wide at the water level, 88 ft. wide at the bottom, and 23 ft. minimum depth. At the western or sea end will be a new harbour of 240 acres, bounded by breakwaters of *béton* or artificial stone; it will have a minimum depth of 26 ft., and 853 ft. width of entrance. There will be a dyke pierced by three locks to shut out the Zuyder Zee; and so treacherous is the soil thereabouts that 10,000 piles will be needed to form a foundation for these locks. The canal will pass through two shallow lakes, which are to be drained for the purpose. Many of the works are so heavy and difficult that they are not expected to be finished till 1876.

Isthmus of Corinth Canal.—So backward is the kingdom of Greece in commercial and manufacturing energy, that there is great difficulty in getting any works of importance constructed. Hence we need hardly be surprised at the absence of good communication between the east and west of the Morea (the ancient Peloponnesus). This world-renowned peninsula is attached to the mainland of Greece by a very narrow neck of land, the Isthmus of Corinth, only four miles broad. If a canal were constructed, it might possibly have the effect of placing Athens on a line of mail route from Egypt and Asia Minor to the Ionian Islands and the Adriatic; at any rate, it would aid in developing the resources of a fertile but ill-governed country. In March 1870, the Greek Government entered into a contract with a French company to construct a ship canal across the isthmus, with a depth of 21 to 24 ft. Projectors (it may here be remarked) have paid some attention to the mainland of Greece, in connection with a

new route from Europe to the East. The German and Hungarian railways now reach Belgrade, on the Servian frontier; and a line of 350 miles long, through Turkey and Greece, from Belgrade to Athens, would bring the locomotive to the shores of the Mediterranean at a point much nearer to Egypt than by any other route. But the Ottoman and Hellenic Governments are alike unfitted to give reality to so comprehensive a work.

Malay Peninsula Canal.—As there are many isthmuses that offer great temptations to the canal makers, so is it in a smaller degree with certain peninsulas. If we look at a map of Asia we see that the Malay Peninsula juts down from the south-east corner of that continent in a remarkable way. It springs from the mainland of Siam on the north, and extends down to Singapore. Its length is little less than 1000 miles from Bangkok to Singapore; while its breadth, near Tenasserim and at other points, is very small. If a ship-canal were cut across the peninsula at its narrowest part it would shorten by 1200 or 1500 miles the voyage from Calcutta and Rangoon to China, and also effect a shortening from Madras and Ceylon. Consequently a project has been recently started with this object, and partial examinations have been made of the interior, in regard to levels, &c. But there are many difficulties in the way. The greater part of the peninsula is owned by sovereigns over whom we have little influence; no company would construct such a canal without a guarantee; and Singapore would be sure to oppose its construction.

Isthmus of Panama Ship Canal.—So tempting is the Isthmus of Panama as the locality for a ship canal running from the Atlantic to the Pacific, that engineers and projectors have for a long series of years directed their attention to that quarter. The curving neck of land which connects North and South America is about 400 miles in length, with perhaps an average breadth of about 60 miles; but in its narrowest part, near the town of Panama, it is only 35 miles wide. This is all that separates the two oceans; but it is a region of rock, forest, jungle, and morass, difficult to deal with in some parts, unhealthy in all. A railway has been at work across the isthmus for many years; but shipowners want to see a canal there, by which vessels could find their way into the Pacific without taking the circuitous route round Cape Horn.

In 1827 General Bolivar offered facilities to Lieutenant-Colonel Lloyd for the survey of the isthmus, with a view to ascertaining the practicability of a canal. After much surveying and some changes of plan, he recommended a canal from Navy Bay in the Gulf of Mexico to Chagres Bay on the Pacific, which would have been nearly identical with the route afterwards selected for the railway. Other engineers preferred a route by the Atrato River, long ago pointed out by Humboldt. Next started up a project, supported by New York capitalists, for a canal through Nicaragua; but the discussions concerning it were so intemperately managed between the envoy of the United States to the Republic of Nicaragua, and the representative of England as protector of Mosquito, that England and the United States were nearly involved in war about it. Prince Louis Napoleon, the present (late?) Emperor of the French, interested himself in this matter, and pointed

out spots on the two ocean-coasts which he deemed likely to be suitable mouths for the canal. Negotiations between Mr. Vanderbilt and Messrs. Baring, as the representatives of American and English capitalists, at one time seemed likely to end favourably for the Nicaragua Canal. This was about twenty years ago, when the gold discoveries in California rendered the Americans anxious to find or make an easy channel of communication from the eastern states to the western, *viâ* the Isthmus of Panama; but the scheme fell to the ground. Almost every year since that time has witnessed a renewal of the discussions on this subject—even so recently as April 1870, new negotiations were opened, but nothing has been definitely arranged.

Prospective Mail Routes.

The mail routes from England to distant climes cannot be very suddenly or frequently changed; because (among other reasons) each is the subject of contract with steam-ship companies, based on definite distances and definite subsidies, and valid for a definite term of years. Hence the constructors of railways and ship-canals have, in many cases, to wait a considerable time before the British Government will avail themselves of the new routes offered.

From Dover to Calais will probably continue to be the chief line of communication to the Continent, with or without a bridge or a tunnel; because the sea-passage is here the shortest. Any mail route from England to India, whether by Marseilles or by Mont Cenis, will have Dover and Calais, or places near them, as two of its points. From England to Belgium, Holland, Denmark, Norway, Sweden, Russia, and the Baltic provinces of Prussia, will probably remain for some time without any great changes in mail arrangements, subject to extensions, but not many alterations of route. To Austria, Hungary, Roumania, and Turkey, the postal and travelling improvements will mainly depend on the driving of the locomotive still farther to the south-east, and partly on the development of steam navigation on the Danube. Italy, as will be seen from the foregoing pages, is placed in a remarkable position in regard to postal communication with England; Marseilles, as the great point of departure for the western parts of Italy, will gradually lose a portion of this trade; the Mont Cenis transit railway takes some mails; the Great Tunnel railway will in a few months carry many more; the Simplon route is inviting the locomotive; while that by St. Gothard is strongly supported by several governments. The more eastern Alpine railways, *viâ* the Brenner and the Sömmering, are out of the path from England, but they are both of them mail routes from other parts of Europe to Italy.

In regard to Egypt and the East, the Brindisi route may ere long become important. When the great tunnel at Mont Cenis has connected the French railways with those of Piedmont, it will open a path to an uninterrupted line of rail through Italy to Brindisi on the Adriatic, whence steamers can find a much shorter line of voyage to Alexandria than from Marseilles. True, Brindisi is at present ill provided with harbour and hotel accommodation, but the supply will

probably grow with the demand. The Peninsular and Oriental Steam Company will be set on the alert by the rivalry of the Adriatic ports on the one hand and the Suez Canal on the other; as in other matters, healthy competition will be beneficial. The Euphrates route, as we have explained, remains in abeyance; and any great route through Asia Minor and Persia, must wait for its realisation until Turkey and Persia become more safe, steady, and commercial.

India and Australia are mainly served by a system of voyages established many years ago. One of the P. & O. Mail Steamers goes down the Red Sea from Suez, and accommodates Aden and Bombay; another goes to Ceylon, where the passengers, mails, and cargo are separated into three groups, one for Madras and Calcutta, one for China and Japan, and one for Australia and New Zealand. No material change seems likely to occur within a few years, so far as the route to India is concerned; but the Australian colonies are yearning for something more. They have tried for a time a mail route round the North of Australia to Singapore; another *viâ* New Zealand and across the Pacific to Panama; and they are now trying another to San Francisco, in connection with the great American railway. But the different colonies cannot agree upon a route which will satisfy all of them.

The mail traffic from England to the United States is becoming more wonderful than ever. The Cunard Company have gradually increased the size of their ships, until such vessels as the *Scotia* and the *Persia* reach nearly 4000 tons burthen. The Inman Company possess magnificent steamers, such as the *City of Paris*, &c., which compete in speed with those of the Cunard line. The Guyon Company have also a fine fleet. The mail routes across the Atlantic to the West Indies and South America are chiefly in the hands of the Royal Mail Steam Company, who have a fine fleet of ships.

America is undergoing wonderful changes in mail and travelling routes. The Rocky Mountains railway gives speedy access to the Pacific, and is becoming an important means of communication to all the Pacific ports of North America; while those of South America are served through the means of the Panama railway. The energetic citizens of the United States are planning great ocean routes across the Pacific, with San Francisco as the starting point. The Asiatic ports of Russia, the newly-opened ports of Japan, Shanghai and the other ports of China, the Sandwich Islands, the Spice Islands, New Zealand, Australia—all are engaging attention. The Americans will probably make some of these routes pay without much in the shape of subvention or subsidy for mails, so impressed are they with the certainty that a great Trans-Pacific trade will gradually develop itself. If such should be the case, passengers and mails will present themselves as inevitable accompaniments, and the greatest of all oceans will become a busy highway of nations.

GEORGE DODD.

THE CONDITION OF THE INDUSTRIAL CLASSES IN FOREIGN COUNTRIES.

Till recently our diplomatic agents abroad seldom travelled out of the region of pure politics, and not unfrequently, it is to be feared, for the sake of employing their energies, meddled in intrigues which they had better have left untouched. Mingling almost exclusively with the aristocracy of the country to whose Court they were accredited, they knew little of the sentiments or aspirations of the great bulk of the nation; and their ignorance in this respect has in former times been the cause of wars and other disasters. It was a matter for congratulation, therefore, when the Foreign Office decided that their Secretaries of Legation should, from time to time, forward to Her Majesty's Government Reports containing trustworthy information regarding the commerce, finances, and general economical condition of the several countries in which their missions were situated. The gentlemen to whom this duty was entrusted displayed so much care and ability in the Reports which they furnished, that in the month of April 1869, the late Lord Clarendon resolved to extend their sphere of usefulness, and addressed a circular to Her Majesty's representatives abroad requesting them to supply information regarding the position of the artisan and industrial classes in foreign countries. The following points were especially recommended as worthy of attention: the proportion of working men to the other classes of the community; how they were paid, lodged, and fed; the nature of their engagements with their employers; and the extent to which the various states included in this survey afforded any opening for our own working men. In obedience to these instructions a large mass of evidence has been collected of more or less interest and value. This evidence has been printed in the form of a Blue Book, but as few persons have the patience to wade through Blue Books, it is proposed here to present the reader with a concise summary of the information thus obtained. It may be remarked that the survey was taken at a fortunate time, when both Europe and America (Brazil and Paraguay excepted) were enjoying the blessings of profound peace. At the present moment it is difficult to forecast what may be the ultimate effect of the tremendous political convulsion of 1870, but it is to be feared that it will tend seriously to retard progress, and to impair the wellbeing of the working classes in the two foremost countries of the European Continent.

Nations, like the individual units of which they are composed, are naturally self-interested; and of course the real object of this elaborate inquiry is to gain information which may be of use to the inhabitants of the United Kingdom and its dependencies. One lesson, however, of political economy is becoming gradually, though feebly, appreciated. We are beginning dimly to discover that, so far from the foreigner's gain being our loss, his interests and ours are so mixed up together that one member of the great community of nations cannot suffer without the others suffering also. Increased facility of intercourse, accompanied by relaxation of custom-house restrictions, have taught us juster views

concerning international trade, and we have learnt that the precious metals, instead of being the ultimate object of commerce, are merely symbols of value.

Half a century ago, and even still later, Englishmen felt, and with some justice, that except in certain departments, such as the Fine Arts, in which our deficiency was an acknowledged fact, this country had little to learn from the contemplation of the position of foreign workmen. All the great material discoveries of the last hundred years, which have practically revolutionised the conditions of modern existence, originated in Great Britain or among our transatlantic kinsmen; and though these discoveries have been accompanied by some undoubted evils, they have tended on the whole to raise the condition of the working classes. It is only lately that continental nations have shared in these improvements, and till within the last thirty years it may be safely said that in industrial development the European Continent was a century behind the United Kingdom. Wars, invasions, misgovernment, and revolutions were the chief causes of this backwardness. Continental wages and continental modes of living were far below the English standard; the food consumed by working people abroad was inferior, both in quantity and quality, to that obtainable by their brethren here, and altogether the contemptuous idea cherished by the vulgar John Bull that foreigners were a half-starved, ill-clad set of animals, was by no means destitute of foundation. When the Allied Sovereigns came over here in 1814, the King of Prussia, surprised at the multitudes of well-dressed people, asked where the populace were. This well-known anecdote affords a striking proof of the high standard of comfort prevalent among the mass of Englishmen even at the close of a long and exhausting war.

But the introduction of railways and other collateral improvements have altered all these conditions; foreigners have advanced relatively more rapidly than ourselves, and have become formidable competitors in branches of manufacture in which formerly we deemed ourselves to possess a secure monopoly. It is sufficient to point to the cotton factories of France and Germany, and the iron works of Belgium. Englishmen have begun to perceive that the position of their country as the great manufacturing centre and commercial *entrepôt* of the world is seriously threatened; and far-sighted observers speculate on the possibility that the hosts of artisans congregated in the busier spots of this island may ere long find the demand for their services greatly diminished. At such a time, therefore, it is well worth while to inquire how the once-despised foreign workman lives, and what there is in his manner of life to imitate and avoid.

The space at our command being very limited for an inquiry of this extensive nature, it will not be advisable to attempt a complete condensation of these Reports; it will be more to the purpose to touch very cursorily on countries of secondary interest and importance, with the view of giving fuller accounts of those communities which are capable of affording useful lessons to ourselves.

Concerning our nearest neighbour, France, Mr. E. B. Malet has supplied a large amount of statistical and other valuable information. Some very interesting items may be culled from his statistical tables.

The reader is at once struck with the fact, that while England is pre-eminently a land of artisans, France, in spite of her late commercial strides, is still pre-eminently a land of farmers. In England the commercial and industrial classes are to the agriculturists as three to one; in France the proportions are reversed: out of a population in 1866 of 38,067,064, 19,598,115 lived by the land, while rather less than eleven millions lived by "industry," as it is technically styled, and a million and a half by commerce. A slight decrease in the agricultural, and a slight increase in the industrial and commercial, element is perceptible in the period between 1861 and 1866. This change, due chiefly to locomotive improvement, seems to be going on all over the civilised world. Great towns increase, while small towns and villages remain stationary.

The main characteristics of human nature are everywhere alike, and in France as well as in England it has been found necessary to protect persons of tender years from being overworked by the greed of employers or the short-sighted cupidity of parents. There are employed in French spinning and weaving factories more than 100,000 children, who are protected by the following regulations. They are not admitted to factories till they are 8 years old. Till 12 years they may work eight hours a day, and from 12 to 16 twelve hours. They may not, with some exceptions, work at night or on Sundays and legal holidays. They are required to attend school. The inspection under this Act was, at one time, performed gratuitously and with much laxity. Now there is a regular system of government supervision.

The rules affecting apprentices and engagements between employers and workmen do not differ so materially from those in force here as to need any special notice. Occasional items of interest peep out among these dry facts. When we read that it is customary for apprentices to render small services to the workmen, such as buying their meals for them, and that in return the workmen teach and take care of the apprentices, a pleasant picture is afforded of the relations existing between the grown men and the youngsters. It is less agreeable to read, that the old-fashioned word "master" is obnoxious to the Parisian workmen, and that "patron" is substituted. The same equalising dislike to a title which implies personal superiority prevails in England and America, where "governor" and "boss" are the euphemisms respectively substituted for it. Lastly, we learn that piece-work is much on the increase, which is contrary to the views held by Trades' Union leaders; and that these piece-workmen styled *tâcherons* often employ men to work for them. This process is called *marchandage*.

With regard to the hours of work, the time is generally twelve hours, exclusive of meals. At Paris and Rouen there are two meals a day, from 9 to 10 for breakfast, and from 2 to 3 for dinner. It is to be presumed that there is some refection in the form of supper after factory hours not cited in this statement, or Gallic stomachs must be of a very long-enduring character.

Till recently, every French workman not being an apprentice was bound to have in his possession a little note-book, called a *livret*, in which were inscribed his name, age, profession, description, his

various engagements, and memoranda of his debts and movements. It is not surprising to learn that these regulations were generally evaded, for even in a police-ridden country like France workmen are not fond of carrying in their pockets a silent witness of all their pecuniary difficulties. The Emperor, who, during his twenty years of rule did much to better the condition of the working classes, recently proposed, at the sitting of the Council of State, the abolition of the *livrets*. He significantly added, "I do not suppose that by pursuing this policy, I shall stifle prejudice, disarm hatred, or increase my popularity; but I am convinced that I shall secure from it new energies to resist evil designs."

Turning next to the question of wages and prices, it is admitted in a somewhat rose-coloured French official report, that while during the last thirty years the cost of living in Paris has increased 45 per cent., wages, even in the building trade—till recently, thanks to M. Haussmann, the most active of all—had increased only 17 per cent. Lodging, too, is vastly dearer; but, then, on the other hand, clothing and furniture are cheaper. The writer asserts, however, that the condition of the workman has on the whole improved. He is less given to intemperance, and to premature marriage, he is more inclined to put his money in the savings' bank, and his average duration of life has increased. It is worthy of remark that in trades where women are exclusively employed there has scarcely been any rise in the rate of wages, in spite of the increased dearness of food and lodging. This painful phenomenon, which exists also in Great Britain and America, is not difficult of explanation. Women are naturally timid, workwomen have little notion of combination, and the pursuits which they usually follow are easily to be learnt by other women, so that they are exposed to perpetual pressure from outside competitors. Contrast, for example, the positions of a barrister and a needlewoman. The one belongs to a Trades' Union, fortified in addition with traditions of mediæval etiquette; consequently, if he gets any work to do, he is highly paid for it; the other is exposed to the competition of the whole female population, for, after a fashion, they all are able to stitch. Speaking of the Parisian sempstresses, Mr. Malet says, significantly, "It is a sad fact, that it is hardly possible for them to live by their wages alone." The tables devoted to the wages received by various artisans, male and female, in Paris, are very elaborate and full of interest. It is worth observing, as a proof of the advantage of intimate intercourse between employers and employed, that the Parisian butchers, who mostly board with their employers, contract orderly and economical habits, and are nearly all members of friendly and annuity societies. Hatters, on the other hand, though gaining exceptionally high wages, from 6s. to 8s. a day in the superior branches of their business, are improvident, and make up for idleness in the early part of the week by working double tides on Saturdays. This is quite after the British fashion, and a very bad fashion too.

The social benefits of the numerous demolitions and rebuildings in Paris during the Second Empire are somewhat doubtful. Formerly the habitations of the working classes were scattered all over Paris; a peer might live on the first floor, an advocate on the second, a shop-

keeper on the third, while in the sixth and seventh story a poor milliner or tailor might be lodged. Now the workmen have been driven into the suburbs; and the London distinction between wealthy districts and poverty-stricken districts is more broadly marked than it used to be. To remedy these evils model dwellings have been built by Government, and by charitable individuals with much the same measure of success as in London; that is to say, where large bodies of people are congregated together, there must be rules and regulations, and workmen do not care to be bothered with rules and regulations of which they justly observe they get enough in the factory. Besides this, there is a faint savour of pauperism about these institutions which causes artisans of independent feeling to shun them. These facts may not be pleasant to read, but they are worth noting. The charitable rich often fail in their attempts to help the poor, because they forget that poor people have just the same prejudices and antipathies that they have themselves.

Several charitable institutions especially affecting the industrial classes in Paris here deserve notice. The *créches*, literally "mangers," where children in arms are taken care of for working mothers, at a charge of 2*d*. a day, have recently been introduced in London. There are seventeen of these establishments in Paris. Next to these come the *Salles d'Asile*, for children from 2 to 7 years of age, corresponding to our Infant Schools. Then come the various schools of technical education. The French workman, it is stated, seizes with alacrity every opportunity of instruction, and his quick intelligence, and pliant understanding, enable him to apprehend things quickly. M. Jules Simon, though an implacable opponent of Imperialism, recently complimented the Government warmly on the care they had bestowed on educational objects. While the First Empire granted for this purpose the pitiful driblet of 160*l*., the Emperor's government gave recently 720,000*l*.

Altogether, when we regard the Mutual Aid societies, the Benevolent Societies, the regulations for obtaining gratuitous legal assistance, the pawnbroking system, and the Arbitration Councils, all of which institutions are sedulously fostered by the State, we cannot but admit that the Government of France, since the Revolution of 1789, is a more beneficent entity than our own. It is not easy to feel much enthusiasm for the British Government; in the eyes of most people, it is merely a machine for collecting taxes, and for repressing, usually in a very feeble and inefficient fashion, gross disorders; but a Frenchman ought, especially in Paris, to regard his Government with feelings of gratitude. Yet it has been proved by unerring political tests, by elections, by the plebiscitary vote, and by the Revolution of September, that the industrial classes of the large French cities, who of all classes are most indebted to the paternal watchfulness of the State, were thoroughly disaffected towards the Empire, and will probably be equally disaffected towards any Government save one based on the principles of 1793. How is this phenomenon to be explained? Mr. Malet points out that a very small proportion of the Parisian workmen are natives of Paris, and that most of them return to the country, but that during their residence in the metropolis they imbibe

that fondness for pleasure, and that desire of change which has been the cause of so many popular tumults. As for their employers, the workmen are firmly convinced that the capitalist is a vampire feeding on their blood; and, consequently, they seem to be incapable of the sentiment of gratitude for any act of the person whom they enable by their labour to accumulate wealth, while they remain poor. Unfortunately, too, the steady, saving workman, as soon as he has acquired a competence, retires to his native place, leaving Paris to the idle, the improvident, and the turbulent, who speedily imbue the newcomer from the country with their subversive doctrines. Thus the well of disaffection is never dry.

For a contrast let us turn to Holland. The Dutch, though but a small nationality, deserve a considerable share of our attention. In strongly-marked individuality of character, in energy and tenacity of purpose, they resemble the English more than any other continental people. Scarcely, perhaps, the English of the present day, with their feverish hurry to grow rich, and their inordinate craving for pleasure and excitement; rather the solid, plodding English of the last century. A Government Commissioner, who visited Holland about thirty years ago for the purpose of collecting facts which might be useful in legislating for Ireland, was delighted with the country. "Nothing," he says, "can exceed the cleanliness, the personal propriety, and the apparent comfort of the people. I did not see a house or a fence out of repair, or a garden that was not carefully cultivated." He adds, "The Dutch people appear to be strongly attached to their Government, and few countries possess a population in which the domestic and social duties are discharged with such constancy; a scrupulous economy and cautious foresight seem to be the characteristics of every class; to spend their full annual income is accounted a species of crime."

This character is still applicable to the Dutch, and it may be fairly asked how they came to be possessed of such invaluable qualities. The answer will be best given by the citation of a parallel instance. Scotland is, by nature, an unpromising country for horticulture; *ergo*, the Scotch gardeners are the most skilful in the world. Dutchmen have been taught to be prompt, vigilant, and industrious by the necessities of their position. A lazy, loitering population would not prosper in a country where a neglected rat-hole in a dyke means devastation to a province.

Mr. Sidney Locock, in his Report, speaks in the highest terms of the Dutch labourer and artisan. "He owes little to nature, much to himself, and what he acquires with pain he guards with care. He reflects on the value of his earnings, troubles himself little about politics, prefers his Bible to the newspaper, and his family fireside to the public-house. Jealous of the liberty he already possesses, he does not sigh for more, and prefers enjoying in peace the advantages already secured to him, to agitating for others which his fathers did without."

This pretty picture is, we suspect, somewhat idealised. The paintings of Teniers and Ostade represent their countrymen as inveterate tavern-haunters, and national characteristics change very

slightly. And though we do not look for historic accuracy in Goldsmith's famous poem, yet the impassioned Irishman must have had some ground for his assertion that Holland was "a land of tyrants and a den of slaves."

Mr. Locock goes on to tell us that though the Dutch artisan gets lower wages than an English labourer, he contrives to have a happier and more comfortable home. He spends less on himself, more on his children, and what he saves in beer he spends in bread. The skilled artisans, such as carpenters, joiners, plumbers, and smiths, receive in the larger towns about 16*s.* per week, which sum is raised to about 22*s.* by odd jobs and the wife's washing. But in small towns and country places an artisan has to content himself with 10*s.* The hours of labour are much the same as in England and France, but the Hollander characteristically refuses to be hurried over his dinner and accompanying pipe. For this meal he demands an hour and a half. The standard of living would seem low to our town-artisans, for meat is rarely tasted. Breakfast consists of a slice of black bread between two slices of white bread and butter, with coffee for a beverage. Dinner begins with potatoes, followed by a mass of carrots and turnips boiled in fat, fish, when in season, and tea. Beer is not drunk at meals. Is not this, however, preferable to the bill of fare of many a well-paid but spendthrift London artisan, who on Sundays indulges in a hot joint from the bakehouse, while towards the end of the week his wife and children are subsisting on dry bread and tea?

Like his English cousin, the Netherlander tries, if possible, to have a house to himself, and in every town rows of houses will be found expressly built for the accommodation of the working-classes, and recently some model dwellings have been erected which successfully combine the advantages of the continental flat-system, without doing violence to the prejudices of the tenants in favour of separate houses.

In France, as we have seen, the State is always interfering, with the most benevolent intentions, between master and workmen; in Holland, a country of individual self-control, legislation for the industrial classes is conspicuous by its absence, there are no Ten Hours' bills, no Children's Protection bill, and even the laws against combinations of workmen are due to the French Code introduced during the Napoleonic occupation. Nor do the Dutch take apprentices. If a boy wants to learn a trade he supplies himself with tools, and goes to a master, who teaches him, giving him, at first, nominal wages in exchange for his services. Strikes among workmen are almost unknown. We say almost, because such a thing has been attempted, but it met with little sympathy, and was speedily suppressed. Masters and men being by law forbidden to fight, learn to arrange their differences by more gentle and civilised means. It is very doubtful whether the relaxations of the combination laws in this country have produced any real advantage. Possibly strikes have artificially raised wages, because for the sake of peace and quietness masters are afraid to make a reduction which would be warranted by the condition of their business, but on the other hand they have produced a world of ill-will and distrust. Strikes are indirectly due to the gigantic manufacturing establishments of modern times, in which there can be no

familiarity of intercourse between the employer and his workmen, and in which the individual workman's feelings are embittered by seeing a colossal fortune acquired for others by the fruits of his labour.

A proof that the Dutch lead, on the whole, contented and comfortable lives, is probably afforded by the fact that they are not at present an emigrating people. Their enterprise in that direction, which dates from the days when they founded the colonies of the Cape of Good Hope and New Amsterdam (now New York), seems to have declined. The so-called "Dutchmen" who throng to the United States, are all Germans; the "Knickerbockers," or descendants of the old Dutch settlers, are held by the Anglo-Americans in far higher social estimation.

Next to some of the manufacturing districts of England, and some parts of the Chinese Empire, East and West Flanders are among the most thickly peopled portions of the earth's surface. Belgium, in general, is a highly productive country; its fields are sedulously cultivated, and its coal-mines give it an importance on the continent to which its diminutive size would not otherwise entitle it. But, altogether, the picture presented by Mr. Pakenham of its working-classes is not very attractive; the farm-labourers and small cultivators live very poorly; the inferior workmen in the towns are obliged to have their scanty incomes eked out by alms; altogether, there is a lamentable absence of that self-denying independence which characterises their northern neighbours. The annals of the two countries fully account for the difference; while Holland gained her freedom centuries ago, the Flemings still languished under the yoke of Spanish despotism.

Artisans, as a rule, seldom work on Mondays, and observe a great many holidays as well; in fact, Mr. Pakenham estimates their working days at 236 in the year. But as Belgium, as compared with England, is a country of small capitalists, steady artisans have little difficulty in rising to the position of masters, and therefore the journeymen are, as a rule, either young or improvident. These men fare very poorly, and their position, says Mr. Pakenham, is little better than that of our worst paid agricultural labourers, or of the poorest class of Londoners. They are as badly housed, too, as our own city poor. The miners, like their English comrades, are convivial and improvident, and ready at the instigation of persons little superior in education to themselves, to join in strikes. The higher artisans are, on the whole, better lodged than in England, and in some respects they are better educated, being able to read and cypher correctly, and to write more or less, but the women are very ignorant. The great bane of the Belgian workmen appears to be their indifference as to the quality of their workmanship. First-rate native work is scarcely to be obtained in any department; and every new undertaking has to be started by foreign money and enterprise. English workmen are often brought over, but they are not unfrequently turned adrift as soon as they have taught their employer some special process of which he desired to gain the knowledge.

Altogether, we incline to think that Mr. Pakenham's brief account of the Belgian working-classes is too depreciative, and that he has

not done justice to the patient, plodding industry which has made their limited territory such a rich agricultural and manufacturing area. Their unrivalled network of cheap and convenient railway lines is alone a proof of Belgian energy and foresight.

Mr. Petre, the Secretary of the British Embassy at Berlin, has prepared an admirably arranged and very elaborate report on the condition of the industrial classes in Prussia. We must here content ourselves with reproducing the broader features of his survey.

There is one fact in these Reports which especially engages the attention of the observant student, namely, that the social revolution produced by the great mechanical discoveries of recent times has been effected much more rapidly in the leading industrial countries of the Continent, such as Germany and France, than in England. The reason is that in England, where those discoveries had their birth, they were adopted slowly and almost imperceptibly; whereas, on the Continent, they were accepted in their full grown condition, and made, therefore, far quicker proportionate progress. Consequently in Prussia, and indeed in Germany generally, we find two states of social life existing side by side; the old feudal life of the ante-manufacturing era, where farm-servants board and lodge with their employers, and where artisans, protected till recently by strict guild regulations, wander from town to town for the purpose of improving themselves in their handicraft; and the modern life of gigantic workshops and hosts of factory operatives, with which we are only too familiar in England. The evils produced by this phase of existence at home are faithfully reproduced abroad. Long hours and sedentary employment produce stunted forms and weakened muscles; the monotonous nature of the work causes an uncontrollable love of pleasure and dissipation; Socialist doctrines are rife; Trades Unionism is not unknown, strikes are not unfrequent, and, in spite of the constant endeavour of many employers to promote the wellbeing of their workpeople, a spirit of hostility towards capitalists largely prevails. We dwell on this point, because it is one of the darkest features of the present epoch, and because it is found to exist under every shade of political institution, Imperial, Constitutional, and Republican: in France, England, and the United States, in short, wherever gigantic wealth and masses of toiling poverty co-exist. Before long the civilised world must find a remedy for this growing discontent, or a heavy penalty will be inflicted.

The population of the kingdom of Prussia amounts to about 24,000,000. The females outnumber the males, as in most other countries; and this disproportion has increased of late years owing to the extensive emigration of grown-up men to America. At the present time the German people are the most emigrating race in the world, even exceeding the Irish in this respect; and their thrift, industry, and general good conduct renders them everywhere valuable colonists. This emigrating tendency is not to be wondered at; it is partly due to the low scale of wages prevailing in their own country; partly to the custom of "wandering" to which their artisans have been habituated for centuries. Originally, these "wandering" expeditions were confined to the German-speaking provinces, then to the other

countries of Europe, and now that steam lends wings to the traveller, no ocean is broad enough to bar their exodus. Even the farm labourers, who in England are such a stay-at-home class, are accustomed to wander in Germany, descending in peaceful hordes at harvest time from barren districts to gather in the produce of fertile lowlands. As for the German artisans, they are to be found in every country in Europe; they visit the watchmaking establishments of the Jura, the machine-manufactories and lockmaking works of England, the arms and gun-factories of Liège, and the industrial establishments of Lyons, Brussels, and Paris. In America, the Germans already form almost a nation, and even in England they are spreading fast. The sugar-refineries have long been in their hands; and the London bakers, who, a generation ago, were mostly Scotchmen, now generally hail from the prolific Fatherland. This colonising tendency is confined to the German race. The Wends and the Lithuanians are stay-at-home agriculturists; nor do the Poles travel much. The labour in the mines and ironworks of Upper Silesia is almost exclusively in the hands of the latter nationality, who are there unfavourably distinguished by their addiction to debauchery and dissipation; insomuch that at many of the mines the wages are paid to the wives instead of to their liege lords. This seems rather a despotic proceeding, but, judging from the spendthrift habits of English workmen, it would not be out of place in this country. In nine cases out of ten the woman is a better economist than the man. Speaking of women, female factory-labour, at any rate in great towns, is hurtful in Germany as elsewhere. The women so employed are often slatternly, dissolute, and make indifferent wives and mothers. As for the poor sempstress who works for "the trade," she fares as ill as her sisters in London and New York—she cannot live on her scanty earnings. Those employed in private families occupy a superior position.

The rapid revolution caused by the rise of the factory system is clearly shown in the case of the Grand Duchy of Baden. The small masters who worked at home were unable to stand the competition, and a period of great distress ensued. This was chiefly relieved by emigration. Between 1852 and 1854 upwards of 12,000 small manufacturers went to North America—a large proportion out of a population of a million and a half. Since then the country has gradually accommodated itself to the new order of things, and prosperity has returned. The unfavourable views expressed above concerning female factory labour may, at first sight, appear to be contradicted by Mr. Baillie's interesting account of the employment of women in the Baden factories. He says: "If factories are well conducted in respect to morals"—this "if," by the way, begs the whole question—"they are a source of benefit, not only to the operatives and their families, but also to the whole population." He then proceeds to show the hard and immoral life resulting from female field-work, and that respectable mothers prefer any other employment for their daughters, if they can get it. The establishment of a well-managed factory in a village changes the scene altogether. The poor girls must then either receive from the farmers better treatment and better wages, or they go into the factory, which thus raises the *morale* of

not done justice to the patient, plodding industry which has made their limited territory such a rich agricultural and manufacturing area. Their unrivalled network of cheap and convenient railway lines is alone a proof of Belgian energy and foresight.

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the whole community. This may well be the case in villages, where the smallness of the population keeps the young women under the supervision of their elders, and under the eye of public opinion; but it is otherwise in great cities, where such control is impossible. Those who know Lancashire will acknowledge the superior appearance and behaviour of the factory girls in country districts compared with those in the crowded centres of population. Baden, it may be observed in conclusion, is decidedly a manufacturing country, possessing the advantage of abundant water-power. Cotton, glass, mirrors, jewelry, and clocks are among the chief articles of manufacture.

The little territory of Hamburgh deserves a few words of notice; for though it covers an area of only thirty-five square miles, it contains one of the principal commercial cities of the Continent. As may be imagined, the population is almost exclusively urban, comprising, out of a population of more than 300,000 persons, less than 10,000 agriculturists. The Hamburgh workmen are, on the whole, well off; their wages are higher than in other parts of Germany, though low compared with the English standard. Their working-hours are long, and their dwelling accommodation is somewhat cramped. Skilled workmen earn about 45*l.* a year; ordinary workmen about 30*l.* a year. It is worth observing, as a proof of the superior thrift and self-control of these people, that the hiring of dwellings by the week, as in England, is almost unknown. The usual term of hiring is by the quarter or the half-year, subject to a quarter's notice, the rent being payable quarterly or half-yearly. It would be well for our town-artisans if they were thus compelled to put by money for the landlord; they might then learn also to put by some for their own benefit. There are plenty of cheap amusements in Hamburgh in the form of theatres and concert-rooms; German workmen are lovers of music; and, till recently, drunkenness was quite unknown. Now, it is said, they have learnt the evil practice of dram-drinking from foreign workmen. Many of the Hamburgh artisans save money, and most of them are members of sick and burial clubs. On the whole they are better provided with clothing than their English comrades. This is partly attributable to the severity of the climate, which renders a great coat and warm winter clothing a necessity. Under our comparatively mild climate, an artisan, who is devoted to the gin-shop, contrives to make the same amount of dress suit both summer and winter.

So much space has already been devoted to Germany that we must speak but briefly of Saxony and Wurtemburg. Chemnitz is the chief manufacturing centre of Saxony, and many interesting details are supplied by Dr. Reutsch concerning the habits of the population. The annual number of working hours average 3104 to the 3040 prevailing in England; but as the Saxon takes more frequent spells for refreshment than the Englishman, he does not produce more. The Saxon workmen are described as second to none in quickness and aptitude, in willingness to work, and in moral qualities; their chief failing arises from not making the most use of their time. Wages have increased, but are still low. The best savings-bank depositors are found to be the married men on small wages and with large families; while the better paid workmen—generally skilful, but rest-

less spirits—more often resorted to the pawnbroker's. The Saxons are proverbially of a contented disposition—no instance of a strike is recorded—and "there seems to be no chance," observes a correspondent of Dr. Reutsch's, "that trades' unions will flourish there."

Wurtemburg contains a large industrial population, who seem, on the whole, to be well off. This is greatly attributable to the fact that a large proportion of the small artisans, the workmen in factories, and the agricultural labourers, possess small landed properties, which act as harbours of refuge in times of distress. Any change in our land laws which would tend to produce a similar state of things here should be welcomed rather than discouraged by our moneyed classes The Wurtemburgers seem to live better than other Germans: the poorest artisan eats meat daily, or, if not fresh meat, sausage; and excellent beer, far purer than the adulterated abomination of our beershops, is retailed at 1½*d.* a quart. A proprietor of copper mines in the Black Forest supplies an interesting comparison between his British and native workmen. The former received thrice as much pay, and spent twice as much in their food, but their superior strength and endurance were compensated by the patient assiduity of the natives.

Mr. Robert Lytton's Report on the condition of Austrian workmen is written with such force and freshness that it deserves a better fate than entombment in a Blue Book. The position of Austria is almost unique among European powers. The population of the empire consists of no less than seventeen distinct nationalities. The same changes are observable in Austria which we have noted elsewhere. The price of labour and the cost of food have risen considerably within the last few years, while the application of the feudal system to land and labour, which was forcibly abolished by the revolutionary legislation of 1848, is gradually disappearing in practice as well as in theory. Before that time the large landed proprietors held Baronial Courts, and exercised civil as well as criminal jurisdiction; they were, in many provinces, the only manufacturers on a large scale, while the State, in addition to the salt, tobacco, and gunpowder monopolies, carried on other important industries, manufacturing porcelain, paper, and chemicals. Every workman was compelled to belong to a Genossenschaft or guild, and this obligation still continues, though the working classes have recently been agitating for the abolition of those exclusive associations. The two chief complaints urged against these guilds are, first, that the apprentices are often made mere household drudges by the masters, and sent away when their term is completed ignorant of the craft which they expected to learn; and, secondly, that the deductions made from the workmen's wages for medical aid and sick allowance might be more profitably spent by the workman himself in obtaining better food and lodging. It is a significant fact that, while the Austrians are trying to abolish the guild system, the English workmen are extending it. But an important point should be noted. The mediæval guild formed a complete hierarchy of labour, embracing master, workman, and apprentice, whereas the master is shut out from the modern guilds of England, and regarded as a hostile power.

We must completely pass over Mr. Lytton's review of the principal

industries of Vienna, and conclude with a few words concerning the personal character of the Austrian working man. The better class of Vienna workmen can all read and write correctly, and are well acquainted with the masterpieces of German literature. "They are probably," says Mr. Lytton, "more ignorant of politics and political economy than their English comrades, yet at working men's meetings their eloquence, correctness of language, and dignity of gesture, would be effective in any assembly." This is probably due to culture, not springing directly from what is ordinarily called education, but rather arising from certain humanising and refining influences affecting their daily lives. Among these may be especially cited their passion for the drama, and their musical skill. Intoxication is rare, and habitual intoxication almost unknown among Austrian workmen, although they drink a good deal of light beer.

To give a thorough account of industrial Switzerland, we should have to describe five-and-twenty little Switzerlands, for every canton has its peculiar laws and usages. This is impossible, so we must be content with a broad general view. The Swiss artisans are in general much better off than their foreign comrades, because they live in their own homes, surrounded by their families, and cultivate their own lands. Moreover, the principles of democracy are here carried out in social life, and serve to remove the barriers which divide class from class, and to establish among all grades the bonds of mutual sympathy and goodwill. Societies of Public Usefulness, intended to promote education, to help the poor, and to foster enterprise, exist in almost every canton. The advantages of mutual kindliness of treatment are shown at the works of the Great Central Railway at Olten, canton of Soleure. Here there are 700 workmen. Their pay is higher than in the factories of surrounding cantons. The hours of labour are limited to from 10½ to 11 hours; and if the operatives fall sick they are treated as kindly as if in their own families. If high prices prevail, the promptest measures are taken to alleviate their distress. Here is the *per contra* side of the account. Cases of ill-behaviour are not merely rare, they have never been known to occur at Olten. The operatives are, moreover, much attached to each other; look upon the director of the works in the light of a father rather than a master, and consider his decision in their quarrels, in the few instances in which they occur, ultimate and binding. Lancashire and Yorkshire might import some of this spirit with advantage. So long as the first aim of masters is to amass a fortune, so long will the men whose toil helps to build up the fortune regard them with suspicion and hostility. The murderous Sheffield outrages are indirectly due to the coarse selfishness of employers, possibly of a bygone generation. "The evil that men do lives after them." Altogether, the picture of Switzerland presented by this Report deserves careful study, and is in many points worthy of imitation. Of course, the conditions of the two countries are very dissimilar. In Switzerland there are no overgrown cities, no millionaires, and nearly every workman has a second string to his bow in the form of land. Here, on the contrary, the mass of the population lives in that state of uncertainty which produces so much improvidence; liable to be turned adrift at the will of some

wealthy proprietor or corporation; liable also to be ruined by perpetual commercial fluctuations.

Sweden cannot be called a manufacturing country, since not more than three per cent. of the population belong to the mining, manufacturing, or artisan classes. In spite of the rigorous winters, and the absence of many kinds of food produced in more genial climates, the people are not badly off, though there is a good deal of emigration to America. There are two classes of agricultural labourers, the "torpare" and the "stat-folk," whose terms of engagement are very characteristic. The "torpare" is provided with a tract of land, generally till then uncultivated. The proprietor erects the necessary buildings, furnishes fuel and pasturage, and the use of his beasts of draught. The tenant cultivates this ground for his own benefit, and, in lieu of rent, gives his services to the proprietor for from one to three days a week. The system works excellently, and when the farmer grows old and infirm his son is generally allowed to succeed him in possession and cultivation of the farm. The "stat-folk" occupy a more precarious position, being engaged by the year, and receiving from their masters lodging, fuel, provisions, and a small sum in money. The Swedes appear to have a genius for co-operative enterprises, and societies of workmen for carrying out manufacturing enterprises, for buying provisions wholesale, and for sick and funeral purposes, exist in all the chief towns. These facts testify to peculiar excellences in the national character.

Mr. Strachey does not, on the whole, give a very favourable account of the position of Danish artisans. Wages have increased, but not in proportion with the increased cost of provisions, and are kept down by the perpetual influx of Swedish and German labourers. The latter are disliked by the Copenhagen workmen, who are generally rabid Scandinavians; "but," as the writer observes, "the Germans have a happy knack of adopting the ways of any country in which they settle." Most philanthropic movements, such as building and co-operative societies, are originated by the richer classes, and merely accepted by the working classes when finally completed. This observation may be applied to our own country. The Copenhagen workman's dwellings are confined and ill-ventilated, and may be compared to those of the Old Town in Edinburgh. Danish cookery is inferior and wasteful. The workmen's wives are not good economists. They generally buy at the worst shops, purchasing very small quantities at a time. Here, again, we may see our own image reflected. An authoritative writer has lately asserted that of ten old and decayed workmen nine have to go to the parish for relief. Yet the Danish operative enjoys, while young, the benefit of an admirable system of obligatory popular education. Mr. Strachey adds, that if the Danish operative be more sober and more moral than the German, he is also less industrious and less frugal; that he has yet to learn the meaning of the word *work*, and that of endurance and thoroughness he has seldom an adequate notion. This is why the Swedish artisan can so often take the bread from his mouth.

We now come to a group of countries whose standard of civilisation is such that the collection and study of statistics is not regarded as a

pursuit conducing to national happiness. Our accounts from those countries, therefore, are meagre, and may be dismissed very briefly.

The industrial condition of Spain is painted in rather gloomy colours, owing, no doubt, to the dislocation caused by the overthrow of the monarchy, and by the subsequent interregnum. In Catalonia and Valencia, the two chief manufacturing provinces, the wages do not appear low, judging by continental standards. The people of Andalusia are described as ill-paid, ill-fed, and ill-clad. They are ignorant, but intelligent. Eighty per cent. can neither read nor write. They are prone to idleness, proud and independent, and very excitable; but, generally speaking, not disaffected towards their employers. Among the better paid and more modernised Barcelonese, strikes are frequent. An excellent charitable institution exists in most parts of Spain for the purpose of advancing seed corn to needy agriculturists at a small rate of interest. It has proved an invaluable palliative in seasons of dearth and famine.

The news from Portugal is scanty but good. Strikes are rare. There are no trades' unions. The character of the people is tractable and gentle. They do not get drunk, and they do not keep Saint Monday. An annual influx of labour takes place from the north to the thinly populated districts of the south, resembling the visits of the Irish harvestmen to England.

Turkey, which is in every way an exceptional country, and which is, moreover, a sort of pet of England's, is honoured with no less than seven separate Reports. These Reports, though brief, are very interesting. They disclose, on the whole, the picture of a fairly industrious and exceedingly frugal people. Nothing strikes the self-indulgent, luxurious Englishman more than the voluntary privations undergone both by Mussulmans and Christians. The former observe the Ramadan, the latter a hundred fast-days in the year, with the utmost strictness. There is employment to be obtained by skilled English artisans as steamboat engineers and in the naval arsenal. In other businesses the native of Northern Europe usually finds himself at a disadvantage by the side of the cheaper-living and more pliant Levantines.

The remarks made about Turkey may be transferred almost exactly to Greece. We must not judge of the Greeks by the intriguers and office-seekers of Athens, nor by the brigands, who are tolerated by dishonest politicians. The rural Greek is a hardworking fellow, rudely lodged, and not too well clothed, but enjoying the advantages of a splendid climate. He is wonderfully simple and frugal in his habits, and keeps no less than 195 religious fasts in the year. On those days, bread, wine, and olives constitute his sole food.

We are glad to learn that the condition of the Russian artisan has improved materially of late years, in spite of the lowering of the duty on vodka (corn-brandy), indulgence in which constitutes his besetting sin. The factory-hands, and the inhabitants of the large towns, live as a rule, better than those in the country, where black bread and water, with a little tea, often constitute the sole diet. Railways, however, are raising the wages and style of living even in remote districts. English artisans of superior intelligence, who possess the

power of self-control, and the faculty of commanding others, are wanted in Russia, as mill-foremen, engineers, and farmers.

Crossing the Atlantic to Brazil, we find that the native Brazilian free population seldom enter into trade or industry. Such occupations are almost entirely in the hands of Europeans, but the cheapness of slave-labour renders it difficult for a free mechanic to obtain employment.

Concerning Peru, the accounts are somewhat more encouraging; the position of a foreign mechanic, if he is industrious, careful, sober, and not overburdened with children, is an advantageous one, as the wages he earns are high. Peruvian prosperity is chiefly due to the guano trade, which causes a good deal of money to circulate through the country. Mechanics are not advised to go out on speculation; they are generally engaged beforehand in Europe, or the United States, and brought out.

Lastly, let us glance at the industrial condition of the great North American Republic. Till within the last thirty years, when steam bridged over the Atlantic, the amount of emigration to America was limited, and consisted chiefly of Englishmen, Scotchmen, and Ulstermen. Then came the exodus of Roman Catholic Irish, caused by the famine, followed by the still larger emigration from Germany. This influx of foreigners has revolutionised social life in the States. The Americans are no longer a homogeneous people, they are rather a *colluvies gentium;* and the industrial pursuits, which were formerly carried on by the natives with such skill and ingenuity, are now made over to foreign immigrants. The modern American, we are told, is "disinclined to share in the rough toil of purely muscular labour;" he likes to become a "boss," or master, a shop-assistant or clerk, and "rather than engage in work which he may deem derogatory to his moral culture," he will emigrate westwards.

Thus it has come to pass that on the Atlantic seaboard, the true Americans are gradually being ousted by the Irish, the Germans, and their descendants. Nearly all the factory and foundry hands in the United States, the miners, the navvies, and the makers of clothing, are of recent foreign extraction. Wages appear high; skilled workmen gain from 9*s.* to 15*s.* a day; unskilled workmen from 2*s.* 6*d.* to 7*s.* 6*d.*; but living is dear, and the irredeemable currency is liable to great fluctuations. The hours of labour are rather longer than in England in the Massachusetts factories, where eleven hours constitute a day's work, with only forty-five minutes allowance for dinner. Three-fourths of these factory operatives are females, and 25 per cent. of the females are under 18. Concerning the factory system, a high authority says, "The physical, moral, and religious interests of our people, require a reduction in the hours of labour. The present system is debasing the native New England stock, and forcing them to emigrate to the west and south. The population which displaces ours is inferior in every respect." Except in New York, working people of the better paid class appear to be well lodged. The tenement houses, occupied by labourers, are not, as a rule, deserving of praise. Trades' unions are not so powerful or well-organised as in England, but strikes are very common, and give rise

to long and obstinate contests. One of the most remarkable of these movements took place in the coal regions of Pennsylvania, and was originally rather a lock-out than a strike; the masters having determined to cease production for the purpose of raising the price of coal. The frequency of American strikes is due to several causes. To the great rise of prices caused by the inflation of the currency during the Civil War; to the turbulent character of many of the European immigrants, and the absence of any bond of sympathy between them and their native American employers; and, lastly, to the doctrines of equality taught by Republican institutions. This equality is theoretical rather than practical; in the absence of an aristocracy of birth, wealth commands even greater weight in the United States than in money-worshipping England, and great corporations (such as railway and coal companies) wield enormous power, both social and political. A good many industrial co-operative societies have been started with fair success, especially by the Irish, but co-operative stores for supplying food at wholesale prices are little known.

Having thus surveyed industrial mankind, if not exactly "from China to Peru," at any rate over a large proportion of the world's surface, we may venture to indulge in a few retrospective observations. The great material discoveries made within a century are gradually revolutionising the manner of existence presented by the whole human race. The change is more perceptible in France than in Spain, and still more obvious in England than in Turkey, nevertheless, the movement is everywhere going on. It behoves us, then, to ask whether it is a movement productive on the whole of good or of evil. We are, happily, at last becoming disenchanted of the illusions which dazzled the eyes of the economists of the last generation. Those sanguine, but short-sighted persons, saw in the discovery of the spinning jenny and the steam engine, the commencement of a Millennium of improved morality, of advanced social comfort, and of international tranquillity. It is scarcely necessary to say that these delusive anticipations have been utterly falsified. The forty years' peace which followed the weariness of the great war, has been succeeded by a series of conflicts, each exceeding its predecessor in bloodshed, while manufacturing enterprise has crowded our great cities with a degraded and miserable population, who may some day, if still uncared for, revenge themselves on the rich and well-to-do by a terrible uprising. But the great discoveries of Watt, Arkwright, and their compeers, must not be discredited because of these evils. The evils are not due to the discoveries, but to the manner in which those discoveries have been used as machines for grinding out wealth for a few at the expense of the labour of the many. In every country we find factory labour (and under this term we include all considerable aggregations of workpeople), productive of similar evils. As a rule, the work, if not absolutely prejudicial to health, tends by its sedentary and unvarying character to stunt the higher faculties both of the body and the mind. Persons of easy, unintellectual temperament, endeavour to escape from this monotony by dissipation; while the sterner and higher natures are apt to be curdled into discontent at the prospect of an existence passed in such uninteresting pursuits. In

France, as we have seen, the excessive love of pleasure and the hatred of the employer, go hand in hand. We believe that a remedy is to be found for this unpromising state of things. How comes it that with all the labour-saving inventions of the last hundred years, the mass of mankind work fully as hard, and at far more monotonous and unwholesome occupations than they did formerly? Some day we shall become alive to the fact that the excessive subdivision of labour, by converting men into machines, has wrought much mischief; and we shall perhaps learn also to make the obligation to labour as universal as that of military service is in some countries. It is surely a far nobler ambition to produce first-rate specimens, both morally, intellectually, and corporeally, of the animal called Man, than to turn out manufacturing products of surprising skill and cheapness. This human excellence is not likely to be attained under present circumstances. The great mass of our city workers follow occupations which, if not absolutely unhealthy, tend to cramp the development of the Man as he should be; and by their exasperating monotony produce a craving for dissipation. Rural workers are, in some respects, much better off; their occupations are far more varied, and they possess the inestimable advantage of breathing pure air while at work; but, on the other hand, they are so insufficiently paid that they can neither feed nor clothe their families as they should be fed and clothed; and their independence of character is often weakened by the frequency with which they are compelled to apply to their parishes for relief. Here, again, the cultivation of Man should be preferred to the cultivation of any other product; and even if it be a fact—which is by no means certain—that small estates are less thoroughly cultivated than large estates, it may still be worth considering whether a number of small, independent yeomen are not preferable as citizens to the ordinary English rural spectacle of an extensive landowner, a body of tenant farmers, and a horde of day labourers. Landed property is a wonderful incentive to patriotism; it is because land is such a widely-distributed possession that the Swiss are so loyal to the Fatherland. When a man talks of taking up arms to defend Switzerland, he is thinking principally of that patch of territory (diminutive though it may be) which owns him as his master. This stimulus to loyalty is sadly wanting in England, where out of a population of 20,000,000, the ownership of the land is divided among some 30,000 persons. A man whose property lies solely in his muscles, his brains, or his bank deposit, may not care, if troublous times should come, to fight for the vague generality known as England; he may think it preferable to transfer himself and his portable property to America. In the old fable the ill-used, overworked ass refused to carry his master away from the enemy, alleging that the enemy could not treat him worse than he was treated already. This apologue may be instructively pondered at the present time.

In conclusion, we may not unnaturally feel inclined to imitate the queries propounded in the patriotic song of Germany by asking: "Where is the Workman's Model Land?" Is it in France? Scarcely so, for in spite of the abolition (theoretical rather than practical) of class privileges in 1789, and the earnest desire of the late Imperial

Government to benefit the working classes, they remain in a condition of unrest and discontent, thus inflicting the direst calamities on themselves and on other countries. Had the Second Empire been loyally accepted by the artisans of the great cities, there would have been no temptation to retrieve popularity by plunging into war. Is the Workman's Model Land in England? Half a century ago we might have answered "Yes," but can scarcely do so now. The line of social demarcation between employer and employed is too harshly defined, and the cordiality of relations which should exist is marred by strikes and disputes. Are the United States of America the Model Community for working men? They ought to be, for they possess enormous advantages over Europe in their abundance of elbow-room. Yet it seems doubtful whether the artisan who can get a fair living in Europe really benefits himself by crossing the Atlantic. Wages appear high, but they are not so high as they seem. The extremes of heat and cold render labour more irksome than in Europe, and the American employers and foremen are severe taskmasters. Add to this that the Socialist theories, so dear to the workman of Continental Europe, have little root in America, that Republican doctrines are confined to politics, so that any supposed advantages, which may be gained by the absence of a titular aristocracy, are fully counterbalanced by the exclusiveness of the richer classes, that the great commercial corporations exercise despotic power, and that, partly owing to the difference of nationality between employer and employed, and partly owing to the lawlessness and restlessness of the immigrant populations, strikes are frequent and bitter. We should rather incline to look for the Workman's Model Land in an older and more settled community, among the quiet, industrious population of Holland, or among the hard-working, highly-cultivated, and intensely patriotic Republicans of the Swiss Confederation.

Both in Holland and Switzerland there are perceptible among the working classes a spirit of self-denial, and a desire to make provision for a rainy day. Both are sadly wanting in England. Working men in this country are not, indeed, alone deserving of blame in this respect, the tendency to a reckless expenditure of present means exists among all classes, but its evils are most severely felt by those who work for weekly wages. The best remedy of all, of course, for this state of things, is the individual self-control which every man, if he chooses, can exercise; but, besides this, a thoroughly efficient system of Education, in which even the rich are at present wofully deficient, may gradually teach us to be less eager in the pursuit of national wealth, and by softening the manners and elevating the tastes of those who live by labour, may silently undermine the barriers of class demarcation. A real sympathy between the richer and poorer ranks of society may then be established, conflicts between capitalists and workmen will disappear, and a universal and intense spirit of patriotism will be engendered in the nation. Mere political changes, especially if accompanied with violence, or even with threats of violence, will never achieve these moral reforms; the movements must be accomplished by the slow and silent, but energetic and united efforts of the whole community.

ARTHUR LOCKER.

IMPROVED DWELLINGS FOR THE METROPOLITAN LABOURING CLASSES.

It is interesting to note the steady progress of the important movement, commenced some twenty-five years since, having for its object the establishment of healthy dwellings for the labouring classes, especially those residing in the metropolis and our large cities and towns, where considerable portions of the industrial population are to be found living under conditions most unfavourable to the interests of public health and morality. Fifteen years ago it was pointed out in the 'Companion to the Almanac,'* that, to some extent, the tenants have only themselves to blame for not being enabled to procure decent and healthy tenements; that in the matter of house accommodation the law of demand and supply prevails, as in almost everything else; for, if lodgers would not hire unwholesome rooms, or tenants hire unwholesome houses, landlords would speedily find themselves compelled to provide something better. But so powerful is the force of habit that, notwithstanding years of teaching, those who suffer most largely from the evils of overcrowding cannot be made properly to understand how much the means of prevention lie in their own hands. The majority of our poorer labouring classes seem to regard as inevitable, the unhealthy and demoralising influences by which they are perpetually surrounded, notwithstanding the fact that, in some parts of the country, notably in Lancashire and Yorkshire, men occupying no higher grade than that of simple artisans, have quietly solved in their own way, without the assistance of others, the problem of supplying themselves with decent and respectable habitations at a moderate rental. Dr. Smiles has shown† that the people of this country voluntarily tax themselves to the extent of 100,000,000*l.* sterling per annum for the purchase of beer, spirits, and tobacco. A portion of this sum would more than suffice to provide the labour-community with a fair amount of decent and healthy lodging accommodation, no matter in what part of the kingdom it might happen to be required. At the same time it is only fair to admit the many obstacles which impede the artisan in his efforts to obtain suitable lodgings for himself and family, particularly in the metropolis, where circumstances have conspired to render the erection of cheap healthy dwellings for artisans and labourers—except at an inconvenient distance from their place of work—a matter of difficulty, if not apparent impossibility. In London, the extensive demolitions occasioned by the formation of new streets and the extension of the metropolitan railway system, have had a twofold effect—they have raised the price of building land, and increased the tendency to overcrowding so common in poor neighbourhoods. This latter evil has been met, to some extent, by the active exertions of the various metropolitan medical officers of health, and by the establishment of artisan

* 'Companion to the Almanac' for 1855.
† Ibid. 1870.

colonies in the suburbs, principally in the southern and eastern districts, whither the workmen have followed the various factories and workshops which, under the operation of the sanitary acts, have become removed from the more densely populated metropolitan localities. More of practical good is owing to the various sanitary acts passed during late years, than most people seem to be aware of. Had these laws not been in existence, nothing could have saved the metropolis, if not the whole country, from the horrors of pestilence some two or three years ago. But, even now, these acts are far from being so perfect as they might be. We are yet in the infancy of sanitary legislation. Still, the progress made is most encouraging. The labours of such men as Dr. Southwood Smith and Mr. Edwin Chadwick have not been in vain. They assisted in sowing the seed, of which we are now beginning to gather the valuable fruits.

Bad and disgraceful as is the state of many of the poorer districts of the metropolis, there is an enormous improvement perceptible if we contrast their present condition with that found existing twenty or thirty years ago. The houses of the labouring poor are now kept in a far better state of repair, are more efficiently drained, have a better water-supply, and are better lighted and ventilated. This, however, has all been done under protest; and, but for the unceasing vigilance of the medical officers of health, things would speedily revert to their former pestilential state. Both landlords and tenants require careful watching. In the Report on the Sanitary Condition of the Whitechapel District, for the quarter ending the 2nd of July, 1870, Mr. John Liddle states that 4624 houses in that district were visited during the quarter. Of these no less than 1560 had to be specially revisited for the purpose of inducing the owners to carry out the sanitary improvements imperatively required. Many owners of property, after they have received notices to do certain repairs—to provide better drainage, or water-supply, and to cleanse the houses—instead of doing the more important works in the first instance, begin to whitewash a room or two, doing nothing more until reminded of their neglect. Then something else is done; and, after another visit, perhaps something more. So long as something is done, legal proceedings are not taken against the offenders. The number of houses visited during the year is very large. In 1867 it was over 32,000. In 1868 it was nearly 29,000. These numbers, for a single metropolitan district, will show the extent to which sanitary supervision is carried on in the metropolis.

Still, as before mentioned, the want of suitable dwellings is severely felt by the metropolitan labouring classes. Year after year wholesale demolitions of working-class habitations take place for railway and other purposes, no provision whatever being made for supplying other lodging accommodation to those thus rudely expelled from their homes. Hence the tendency to overcrowding, of which the sanitary officials so repeatedly complain. The number of houses taken down in the Whitechapel district during 1868 was 205. Allowing an average of nine persons only to each house—an estimate far under the mark—this gives a total of 1845 persons deprived of lodging accommodation. The number of houses rebuilt during the same

period was nine, affording accommodation to eighty-one persons. In St. Pancras the demolitions occasioned by the extension of the Midland Railway to the Euston Road led to even greater inconvenience to the labouring classes, the number of families dispossessed of their homes being estimated at several hundreds. A similar process is now going on in Bethnal Green and Hackney, through which the railways are gradually creeping up to the City. The total number of men, women, and children, who have thus suffered during the last ten years from the destruction of the houses in which they resided, is computed as being not less than 150,000. It is always very difficult in matters of this character to obtain accurate statistics, yet there seems no reason to doubt the correctness of the assertion that, during the last ten years, no less than 150,000 souls, belonging principally to the industrial classes, have been peremptorily deprived of their customary lodging and house accommodation, without having any other provided them. An indication of the mischief thus occasioned was recently afforded at a coroner's inquest, touching the death of a little child aged three months, who was suffocated in bed at No. 46, Baldwin's Gardens. It appeared that the parents and their four little children occupied a small back room in the house, the whole family sleeping in one bed, head to foot. The house contained seven families in its seven rooms, the whole atmosphere being tainted, the drainage defective, and the water necessarily foul and insufficient. This house was only one of many similarly occupied.

Yet, serious as is the amount of inconvenience and expense thus occasioned to large numbers of the working classes, a remedy would long ere this have been found, but for the existence of a most unfortunate impression, to the effect that improved house accommodation for working men could not be rendered remunerative to those providing it. In other words, it was held that the supply of suitable homes for labouring people could be effected only as a costly act of philanthropy, not as a profitable commercial speculation, based on strict business principles. The earlier experiences of "The Metropolitan Association for Improving the Dwellings of the Industrial Classes" tended, in some respects, to confirm this injurious notion, but during the last few years the financial returns, not only of this particular association, but also of almost every other of a like character, show that improved dwellings for the labouring classes really form one of the safest and most profitable methods of investing capital in this country. As these facts become more widely known, we may reasonably look for an enormous increase of capital so invested. When capitalists find that there is a safe and sure means of obtaining from 5 to 6 per cent. on their outlay, they will soon become as ready to lay out their money in this way, as to patronise railway and other schemes which, after all, seldom realise more than from 2 to 3½ per cent. profit. A nation which can afford to invest 400,000,000*l.* sterling on comparatively unprofitable railway undertakings, surely can have no difficulty in raising 2,000,000*l.* or 3,000,000*l.* to assist in developing a larger and more certain source of profit.

"The Metropolitan Association for Improving the Dwellings of the Industrious Classes," and "The Society for Improving the Condition

of the Labouring Classes," may be regarded as the pioneers in the important work of providing healthy and comfortable homes for the artisans and labourers resident in the metropolis. The former of these organisations was established about twenty-seven years ago by Dr. Southwood Smith, Mr. Gatliff, and other gentlemen taking an interest in the question of the sanitary improvement of town dwellings. But the society had to contend with formidable obstacles, of which the associations of later date have known little or nothing. For instance, the association could not be formed until a special charter had been obtained from the Crown, the then existing state of the law with respect to the unlimited liability of shareholders preventing many persons from joining until the amount of their liability could be clearly defined. Had the law of limited liability been in force thirty years ago, the early history of the association would have presented fewer adverse features, and the construction of improved dwellings for artisans would have received a powerful impetus. Moreover, the tone of public feeling was not sufficiently encouraging in favour of the movement represented by the association. The importance of sanitary reform was then only just beginning to be recognised, and its advocates were frequently regarded as being somewhat Quixotic in their ideas. But the association, once fairly started, never relaxed in its operations. People solemnly predicted that, however well-intentioned might be the experiment of erecting healthy dwellings for working-class families, it would never pay. To prove the erroneous nature of this supposition became the great object of the association: but, despite every effort, it seemed as if the ominous warnings of the prophets of disaster were destined to be realised, for, in 1854, when the association possessed six establishments, the financial results were not very hopeful, the gross rental for the year ending March 1854 being 4809*l.*, and the charges thereon—such as sewage, police, and other rates and taxes, also cost of gas, repairs, superintendence, &c.—being no less than 3040*l.*, or more than 60 per cent. of the entire rental. In 1870 the actual rental obtained from the various establishments, eleven in number, belonging to the association, was 11,510*l.* 10*s.*; the charges on the same being 4,157*l.* 18*s.* 8*d.*, leaving a profit of 7352*l.* 11*s.* 4*d.*, and enabling a dividend of 4 per cent. to be paid on the subscribed capital of 106,815*l.* In 1868 the dividend amounted to 3½ per cent.; in 1871, it will probably reach 5 per cent.; a fact showing that, after all the difficulties and trials which beset the earlier career of the association, it has worked itself into a prosperous and flourishing condition. By the terms of the charter granted to the association the shareholders are not permitted to receive a larger dividend than 5 per cent.; consequently, all profits beyond that limit will go to form a reserve fund. The number of tenements belonging to the association is 796, including 164 cottages at Penge, and 69 cottages at Mile End New Town.

Of the two establishments for the use of single men, one, that in Soho, has been given up, and the other, in Albert Street, Mile End, has been converted into dwellings for families. The average population of the various tenements during the year ending March 1870 was 3827. The number of deaths in the same period was 60, of these

39 were of children under 10 years of age. From this it would appear that the average rate of mortality in the buildings belonging to the association is under 16 per 1000, whilst that of the metropolis generally has exceeded 24 per 1000. In 1869 the mortality was about 18 per 1000, in 1868 it sank to 14 per 1000. In former years the mortality was even less, but this was exceptional, arising from the fact of a portion of the property belonging to the association being tenanted solely by adult males.

The experience of the Association proves that the attempt to provide accommodation on a large scale for single men can seldom be made remunerative. The Albert Street Buildings, containing accommodation for 234 inmates, had an average occupancy of only 157. These buildings have recently been converted, at a cost of 3000*l*., into tenements capable of accommodating forty-six families. In their new form, these buildings are now likely to become a source of profit, instead of loss, as formerly. The Association's cottages at Penge constitute a very important experiment, having for its object to ascertain how far the metropolitan working classes are willing or able to avail themselves of suitable dwellings erected in the extreme suburbs. The result has been eminently favourable, nearly the whole of the Penge cottages, 164 in number, being occupied by tenants employed in artificial flower-making, bookbinding, bookmaking, brass-finishing, brush-making, carpentering, carving and gilding, electro-plating, fancy-box making, gardening, gun-making, paper-staining, tin-plate working, wood-engraving, wood-turning, and the like. All the tenants have the use of what are termed "Workmen's Trains," on the metropolitan lines, railways running to and from Penge. The fare by these trains is 1*d*. each way. But the present mode of running workmen's trains is attended with serious inconvenience to the tenants, there being only two of these trains each morning; one at 5.15 A.M., the other at 7.15 A.M., the latter arriving in London before 8 A.M. As there are many of the industrial classes, such as warehousemen, porters, compositors, bookbinders, engravers, working jewellers, &c., whose places of business do not open before 9 A.M., the tenants of the Alexandra Cottages so employed have to waste an hour in the streets, exposed to all weathers, before they can obtain access to their workshops. Several tenants of the Penge cottages have left in consequence of the inconvenience thus experienced, and many of the others have lodged complaints with the superintendent employed by the Association. This is a matter of very grave importance, and one which must, sooner or later, be settled in some way or other by Parliament. The main obstacle to the erection of workmen's cottages at moderate rentals in the suburbs, is the comparatively high railway fares on most of the lines. From Broad Street to Hackney or Homerton, the lowest return fare is 6*d*., or 3*s*. per week. This is a heavy item to a man in the receipt of not more than from 20*s*. to 30*s*. weekly. Moreover, if his wife, or any of his family, wish to use the railway, no lower terms are provided them. Even where workmen's trains are provided, they are invariably run at most inconvenient times, it being a species of traffic little in favour with railway directors, save on the Metropolitan Railway. Yet it seems

simply an act of justice to compel the different railway companies to place within reach of the thousands of working-class tenants, rendered homeless through continual metropolitan railway extensions, the means of cheaply and readily reaching the suburbs. The extension of the Midland Railway to St. Pancras led to hundreds of working-class dwellings being swept away, but the Midland Railway authorities have not, to this day, assisted those whom they have all but forcibly deprived of their homes, to obtain other habitations. Hence the formation of an Artisan Association to procure the compulsory running of workmen's trains. It should, however, be mentioned that the various railway companies have recently expressed their willingness to run workmen's trains more frequently, if their liability, in case of accidents, be restricted to 100*l.* per passenger. Should this compromise be accepted, a result of which there is some doubt, or should Parliament compel the companies to run the required cheap trains, the number of working-class families resident in the suburbs will soon become considerably increased.

But, to return to "The Metropolitan Association for Improving the Dwellings of the Industrious Classes." We note one circumstance strongly illustrative of the good character of those inhabiting the various buildings. This is the fact of all the bad debts, during 1869-70, out of an average of 770 tenants, amounting to 20*l.* 1*s.* 5*d.* only, or less than one halfpenny in the pound upon the gross rents received, viz., 11,510*l.* 10*s.* This comparative absence of bad debts constitutes a marked feature in the operations of associations for the establishment of improved dwellings. It is the result of insisting upon regular payments. At first there was an appearance of harshness about this system, but now the advantages are understood by the tenants. In like manner intemperance is a vice almost unknown in these dwellings, the inmates of which are characterised by their love of tidiness, courtesy, and respectable appearance. It would be difficult for a stranger to believe that the inhabitants of the various improved dwellings, no matter by whom erected, could belong to the same class as that found inhabiting the low fever-seeking neighbourhoods, the hotbeds of ignorance, vice, and crime, which to this day form the great reproach of the metropolis.

The "Society for Improving the Condition of the Labouring Classes" has been in active existence rather more than twenty-six years. It was originally termed the "Labourers' Friend Society," and for a considerable time it devoted its energies to the development of the cottage-garden-allotment system in rural districts. Of late years, however, the principal object of the association has been to show the manner in which existing working-class dwellings can be rendered more clean, healthy, and comfortable. The principal obstacle to the increase of model dwellings, such as those erected by the "Society for Improving the Dwellings of the Industrious Class," is their great expense. When capitalists find this species of property sufficiently remunerative, they will more readily invest in it, and thus lead to its extension; but until then, until the new class of buildings becomes more numerous, it is simply a matter of necessity that those already existing should be rendered as healthy and comfortable as

possible. If we cannot sweep away our courts and lanes, we can, at least, do something to render them more clean, cheerful, and free from disease and vice. The history of Wild Court, Drury Lane, is well known. The society obtained possession of this court, one of the very worst of its class, and after completely renovating the houses —ventilating, draining, cleansing, and otherwise improving them— were enabled to let the various tenements at low, but remunerative, rates. The effect of the improvement was shown in the changed character of the court, the more decent demeanour of the tenants, their cleanliness and increased health. The experiment has been successfully repeated elsewhere by the society, but the funds at its command are not sufficient to admit of any considerable effort in this direction. The society possesses several model dwellings, both for families and single men, also a laundry for the use of labouring women. Although the society is largely assisted by donations and voluntary contributions, its operations are based on commercial principles.

"The Improved Industrial Dwellings Company, Limited," was originated in 1863, for the purpose of developing a scheme then made public by Mr. Alderman Waterlow, for providing the industrial classes of London with healthy and comfortable homes at moderate but remunerative rents. The Company possesses a share capital of 125,000*l.*, fully subscribed, to which is to be added a borrowed capital of 125,000*l.* from the Public Works Loan Commissioners, making a total of a quarter of a million sterling. Up to the present time, the association have erected 1047 distinct tenements of the healthiest character, and, with the exception of seventy-two tenements in Derby Buildings, King's Cross, fitted up complete with every convenience for separate use, in some of the most densely populated metropolitan districts. The company were fortunate enough to secure the services of an architect and builder, Mr. Matthew Allen, of Finsbury, who had long and successfully devoted his attention to the best form of structures required. Under his superintendence, nearly the whole of the buildings belonging to the association were erected. They are situated as follows: Stanley Buildings, Old St. Pancras Road; Cobden Buildings, King's Cross Road; Tower Buildings, Wapping; Cromwell Buildings, Southwark; Palmerston Buildings, City Road; Nelson Buildings, Greenwich; Derby Buildings, King's Cross Road; Gladstone Buildings, Finsbury, and Ebury Street, Pimlico. These various buildings are nearly all constructed on one principle, consisting of one or more blocks, of from five to seven storeys, or flats, upon each of which are arranged four distinct tenements of two or three rooms, with a scullery or wash-house to each. The rooms are tastefully papered, the entrance door to each dwelling being numbered and provided with a knocker. All the rooms have fire-places, and are light and well ventilated; each living room is provided with a kitchen-range, with oven, boiler, &c. There are plenty of cupboards in each tenement, and the wash-houses or sculleries are each supplied with a separate water-cistern, sink, closet, coal-place, capable of holding half a ton of coals, copper, dust-shoot, and other conveniences. The open staircase principle, with its

balcony-like landing-places on each storey, assists in removing from the exterior the unfortunate resemblance to a workhouse or barracks, which characterised the earlier edifices of this class. The summits of the buildings being flat, and covered with asphalte, are used as playgrounds for the children of the various tenants, or for drying clothes. On fine summer evenings the artisans are often to be found up here, smoking their pipes or reading their newspapers, after their day's labour. To stand on the roof of one of these lofty blocks of industrial homes, and to gaze over the high parapet on the wilderness of little houses, extending in every direction, dirty, dilapidated, and uncomfortable, is to comprehend the enormous advantages which improved tenements, such as those supplied by the Association, offer to tenants capable of paying a rental of from 4*s.* 6*d.* to 7*s.* 6*d.* weekly. This may appear high, yet the large number of applications from would-be tenants shows the rentals to be under the current rate. Working-people, however, sometimes have truer notions of real economy than is usually supposed. The wife of one of the tenants, being asked whether she considered the rent too high, replied that it certainly was dearer than in the neighbourhood where she had previously resided, but then, on the other hand, her new home enabled her husband to come home and have his meals with his family, instead of taking them at the public-house, as he used to do. The saving thus effected, more than made up the difference in rent.

The average weekly rental of a room, even in the most miserable dwellings in the poorest districts, is 2*s.* 6*d.* per week. The rental, per room, in the company's buildings, averages about 2*s.* 5*d.* But this is no real comparison, for the customary dwellings of the labouring classes contain none of the comforts and conveniences provided in such buildings as those erected by the society and kindred associations. In the suburbs, especially in East London, large numbers of cheap cottages, well constructed, and having neat gardens at the back, have been erected, but the want of workmen's trains at suitable hours, and the too great distance from the places of employment, occasion an enormous percentage of these houses to remain unoccupied. This led the Industrial Dwellings Company to attempt another experiment. Having acquired a site in Wilmot Street, Bethnal Green Road, a block of dwellings was erected on a new principle. From the street the appearance of these buildings is not unlike that of the three-storied middle-class residences so common in the suburbs, and forms a marked contrast to the great bulk of artisan's homes in the neighbourhood. The basement is situated below the level of the pavement, being reached by steps from the front entrance; a flight of steps leading to the ground-floor and upper floor. Each dwelling contains three rooms, fitted up in the same manner as those in the large blocks of buildings nearer the City, but possessing more conveniences and space. They are intended for the superior class of artisans, and are let at rates varying from 7*s.* to 7*s.* 6*d.* per week. Each tenement has a separate and distinct door opening upon the street, and to those on the basement and first floors plots of garden ground are allotted, the tenants of the upper floor

having the exclusive use of the flat roof. The buildings erecting in Ebury Street, on the Marquis of Westminster's estate, are somewhat varied, so far as external appearance is concerned, from those in other parts of London. This was rendered necessary by the comparatively superior character of the neighbourhood, and the Marquis requiring the buildings to be as attractive-looking as possible. This object is effected by the introduction of large shops, with suitable accommodation for shop-keepers on the ground-floor; the upper stories being used as small tenements, and the roofs facing the streets being furnished with high gables. The rental obtained from the shops is expected to cover both the ground-rental and the increased cost of construction; thus enabling the rentals of the small tenements to be relieved. As the new buildings are within a few minutes' walk of Eaton and Belgrave Squares, it was expected that they would afford accommodation to the families of a large number of married men who, being employed as butlers, footmen, &c., in that neighbourhood, were obliged to reside near their work, and for whom there were little suitable dwelling facilities in the neighbourhood—a circumstance which has hitherto led to the overcrowding of the numerous mews situated in the rear of our fashionable streets and squares.

Despite the large amount of distress which has, during the last few years, prevailed among the metropolitan labouring classes, the number of unoccupied tenements belonging to the society is extremely small, being about 4 per cent. only. Of these the greater part are at Wapping and Greenwich, where the dearth of employment has been greatest. At the half-yearly meeting of the society, in August 1870, it was stated that the gross rents received during the half-year amounted to 6878*l.*, and interest on moneys in banks, &c., to 68*l.*, making an income, during six months, of 6946*l.* The total expenditure during the same period was 3169*l.*, leaving a profit of 3777*l.*, which was equal to 6 per cent. on the subscribed capital.

Miss Burdett Coutts' benevolent effort to provide good and healthy dwellings for the Bethnal Green artisans, has led to results precisely similar to those which have attended the operations of the various associations just described. Columbia Square, consisting of four immense blocks of tenements, all of which are inhabited by respectable tenants, is situated in what was formerly one of the very worst and most demoralised portions of the metropolis. The erection of the new buildings speedily exercised a perceptible influence on the moral character of the locality. Owners of house property began to perceive the advantage of rendering their dwelling accommodation more comfortable and attractive; a sure means of securing a respectable and steady class of tenants. Hence, whole streets have been rebuilt in a style superior to that formerly common, although not so complete in some things as could be wished. The principal obstacle that impedes the improvement of house property in the poorer districts is the want of sufficient means on the part of many of the proprietors. They are too poor to effect the desired alterations, even though these alterations would produce increased profits. Capital, no less than inclination, is, therefore, requisite.

Mr. Peabody's munificent endeavour to increase the amount of im-

proved lodging accommodation for the metropolitan labouring classes does not appear to have met with the success originally anticipated. With the first gift of 150,000*l.* four groups of buildings have been erected in Spitalfields, Islington, Westminster, and Shadwell respectively. These contain, collectively, 498 tenements, affording accommodation to nearly 2000 men, women, and children. In addition to these four groups of buildings, another is in progress at Chelsea. This latter, when completed, will contain 68 tenements. A site, not yet built upon, has also been secured at Bermondsey. In the Shadwell buildings one-fourth of the tenements are unoccupied. This is attributed by the trustees to the continued stagnation of trade in that locality; this conclusion being apparently confirmed by the fact that in the other buildings there is an increasing demand for dwellings in excess of the accommodation. Still, it cannot be disputed that the dwellings in Shadwell and Spitalfields are not quite so popular as they were expected to prove. They have too much of a workhouse aspect, and lack several important elements of comfort. The walls of the various rooms are of unplastered brick, covered with a coating of whitewash; the passages are cold and gloomy, and there is a perceptible general want of cheerfulness. Apart from these defects, the arrangements in each tenement are very good; in some respects they are excellent. But working people, especially the more respectable portion, do not care much for mere convenience, apart from comfort. A second donation, amounting to no less than 200,000*l.*, from Mr. Peabody, became available for building purposes in July 1870. It had become increased by interest to the extent of 9471*l.* 0*s.* 7*d.* With a portion of this money the trustees have purchased 15 acres of land at Brixton; 1 acre on Cheyne Walk, Chelsea; and the Magdalen Hospital estate, 3 acres in extent, in Southwark. The amount paid for these three sites was 33,711*l.* 16*s.* 3*d.* In 1873 another donation of 150,000*l.* will become available. This will make the total sum bequeathed by Mr. Peabody, for the use of the London labouring poor, no less than 500,000*l.*

In addition to the foregoing five leading agencies, now actively at work in augmenting the amount of improved lodging accommodation for the metropolitan labouring classes, there are other movements on a limited scale in various parts of the poorer districts. Among these may be mentioned the Marylebone Association, the London Labourers' Dwelling Society, the Jewish and East London Association, and others. In Shadwell, a gentleman named Hillyard, belonging to the legal profession, has erected a number of superior and picturesque-looking cottages, which seem to have proved fairly remunerative. Large numbers of superior cottages have also been erected by building societies. Many of these dwellings are the property of the members, not a few of whom belong to the superior artisan classes. The majority of these cottages contain parlour, living room, three bedrooms, scullery, and garden; the rent varying from 8*s.* to 10*s.* per week. Smaller houses are procurable at cheaper rates. The streets are usually well paved and lighted, and the general appearance of the houses is most respectable. Much of this, however, is due to the operation of the Building Acts, which prevents the con-

struction of narrow courts and lanes like to those which, in the older parts of London, still seriously impede the efforts of sanitary and social reformers. The preliminary step towards increasing the amount of suitable lodging accommodation for working-class families evidently consists in rendering access to the suburbs cheaper and more readily available. A workman ought to find it cost him no more money or time to reach his employment from the suburban districts, than to gain it from the crowded neighbourhoods nearer at hand. It is strange that the railway companies cannot be made to perceive what an enormous traffic they might derive from an extensive migration of metropolitan artisans to suburban localities. They would possess a regular flow of passenger traffic, and their City extensions, instead of being viewed with feelings of disapprobation, would be hailed with delight, for with every court, lane, or alley that disappeared under the demolishing hands of the companies, we should have one less source of vice and pestilence. Until the railway companies have learned their true policy in this respect, the erection in populous neighbourhoods of large piles of superior working-class tenements, similar to those constructed by the Society for Improving the Dwellings of the Industrial Classes, must remain an imperative necessity.

JOHN PLUMMER.

THE SQUARES OF LONDON.

THIS shall be a paper of the grumbling type, but we will begin by being grateful. Whatever the present condition or prospects of the squares of London may be, we should be thankful that we have them. The haunts, or rather the strongholds, of disease and pollution are rendered unsafe by these islets in our unparalleled desert of slate, brick, and flag. In them the sun shines—dimly, no doubt, from our smoke plague—the winds seem to attain a little more freedom, and the trees persist in growing, no matter how badly they are treated.

We have many squares in all parts of the City, but assuredly not half so many as its colossal expanse requires. In the suburbs, unhappily, they do not seem fashionable with the cheap builders nowadays. These seem as if they were gradually tending to the extermination of small gardens as well as squares. If matters were arranged as with our neighbours the French, the square and wide airy road would be laid down long before the builder came to arrange the ground as seemed best to him. They say to him, here you may build, but do not encroach on the space necessary for public convenience, and thus they avoid the tortuous, close, and often dirty suburban roads which tend to make many of the most agreeable districts round London unvisited by and unknown to all but their inhabitants. I know nothing more disheartening and unwise in its way than our system of mean and narrow suburban roads. In South London,

matters are not so bad in this respect; but just think of the road to pleasant Kew and its vicinity *viâ* Hammersmith. Why no person not inured from early years to such a road would willingly run the gauntlet of taking it if there was any alternative. A broad and pleasant tree-planted road through such a district would, by opening it up and making it attractive to the inhabitants of London generally, prove as beneficial from a commercial as from a sanitary and an æsthetic point of view. And if such roads as convenience and good taste demand existed in a city the size of London, squares would be of less importance. Our new Thames Embankment, for example, is better than a score of squares. But I am diverging from the square.

It surely cannot be necessary to point out the benefits that a square confers on the district immediately around it. All, or nearly all, our present expenditure for public gardening is on the vast parks of which London is happily the possessor. But so long as the parks are separated by miles from each other, so long must the square or other open space be of the highest importance. The advantage of a park to those who pass one hour out of two hundred in it, is not so very evident; it is far otherwise with contrivances which improve the spots in which people work and sleep. Parks for play and exercise, and beautiful garden scenery, let us have by all means, but our great want is the smaller open spaces called squares, and wide roads planted with trees. Where roomy streets are fringed with one or more lines of trees that have been proved to thrive well in cities, most of the advantages of squares are secured. But as these seem impossible to us at present, if we cannot have what we like, why the best way is to like what we have, and try and make it more worthy of our love.

Into the history of our squares I have no wish to enter; their present condition is what is of most importance to us. We were, I believe, the first to make squares; though, judging by present appearances, we shall be among the last to improve them. We have in London squares of various degrees of magnitude and keeping, from the west-central squares, with their fine old trees, to the new Brompton ones with their three-year old Lilacs; from the wide west-end square to the small and dark, and grimy ones in Soho or the City; but the very best of them are badly kept, and utterly unworthy of London. From Eaton or Russell Square to the "Squar de Leicester" is indeed a deep and ignoble descent, but the stamp of neglect and ignorance is upon all. Write the history and deal with the materials of your own time, and do not afflict us with your notions of times or things, of which you can know very little, says the philosopher; so, here, we will have a look at the condition of Leicester Square in the latter half of the nineteenth century of the Christian era.

When, generations hence, our descendants shall have abolished smoke from their cities and made them much less effective in destroying the health and enfeebling the physical powers of the race, perhaps some of them will glance at this beautiful little scene, and look back with pity on the urban lives of their sires. An unhorsed statue lying in ignoble dirt; a propped-up horse with a large basin-like hole in the

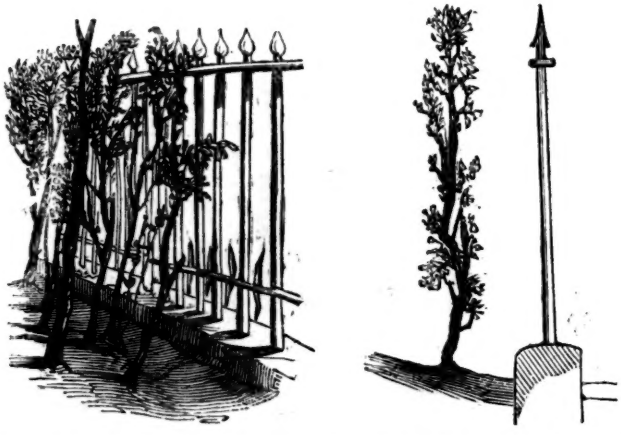
middle of his back; a filthy dead-dog-and-dead-cat bestrewn surface; and a rusty, decayed railing, broken away in parts, form the picture. A few tattered Hawthorn bushes remain on one side, and bloom beautifully there, notwithstanding the neglect and the uncontrolled ravages of the boys when they are in flower. This unhappy square is capable of being made, with but trifling expense, quite as beautiful as such little Parisian squares as that of Montrouge, which, previously to recent events, were perfect gems in their way. It is somewhat unfortunate that our French friends should have the worst of all our squares in the middle of their London quarter. We can hardly expect that they too will agree that London is the centre of civilisation, so long as we damp their gay souls by such scenery as this. Let us

Leicester Square, June 1870.

turn from this disgraceful scene—a long-standing evidence of the feebleness of our vaunted system of local self-government, and glance at the condition of our squares generally.

So far as I can discover, no clear idea of what a square should be has ever been possessed by those who designed them. The chief feature they have in common is a very dirty and very ugly crowded bank of Lilac and other common shrubs just within the margin; so that it is, in most cases, impossible to see into them. It has been assumed that the right thing to do was to hide the persons who do wander into them from the passers-by, and thus the only fresh and pretty spots in many parts of the town are lost, so far as their general effect is concerned, and all from mistaken ideas as to the wants of the few persons who wander about, ghoul-like, in

the musty and dripping shades of the interior. There is nothing in any of our parks, there is no feature in any of our public gardens, more beautiful and effective than even our small squares could be made, but little can be done so long as the absurd system of cutting off the scene from public view and from the view of the persons who inhabit the square prevails. There are squares in London in which views, almost Arcadian in their beauty, could be made; yet, from the windows of the very persons who support them, you can see nothing but a struggle between Privet and Lilac. Two of the finest weeping Ash trees that I know of anywhere are near the margin of Brunswick Square, but they are so surrounded by the inevitable scrub of mean bushes, that they are rarely recognised by the passer-by. Cleared around and surrounded by well-kept turf, they would prove ornaments to the whole district. But it may be urged that the squares are private property, and that their owners



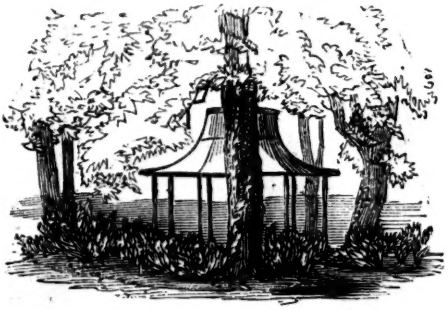
Margin of a London Square, with edge of plantation designed to cut off the view; and Section of Railing and Hedge surrounding Park Crescent, July 1870.

have a perfect right to keep them shut out from public view, if so disposed. Even so, it is quite possible to do this without making the margin inviting as a depositing ground for miscellaneous rubbish, and without wholly concealing the finest objects they contain.

By allowing the grass to venture near the railing here and there, and dotting it with flowers and isolated shrubs, so as to permit of pleasant peeps into the interior, quite a new aspect would be given to our now gloomy squares, and the change would not by any means involve the destruction of all privacy. No conceivable harm could come of making these little gardens attractive to the public, and in doing this they might be made tenfold more so for those who have a "right to them." Notwithstanding the great number of persons that often crowd into a Parisian square, there is not one of the squares of that city that is not a far more attractive object than any London one, and I have not the slightest doubt that if we could drop the square St. Jacques into our West Central dis-

trict, there would soon be a general desire on the part of the owners of our squares that they should be disposed in like manner. In that small, much-frequented square I have seen far more rare and valuable plants in masses in the open air than are exposed in our great public gardens here, and without the least danger, though crowds frequented the place from morning till after dusk.

Another important feature of the arrangement of our squares, and one which, like the filthy and crowded marginal shrubbery, is common to nearly all of them, is the disposition of the central portion. The ground is usually so small that it is desirable to make the most of it. The best possible course to make it look mean and contracted is to raise a plateau, and on this build a structure varying in appearance, as it looms through the trees, from the aspect of a wooden summer-house to that of a bathing-machine. Yet this is what is done in the majority of what may be termed the "best" London squares—in Cavendish Square or Lincoln's Inn Fields, for example. The eye



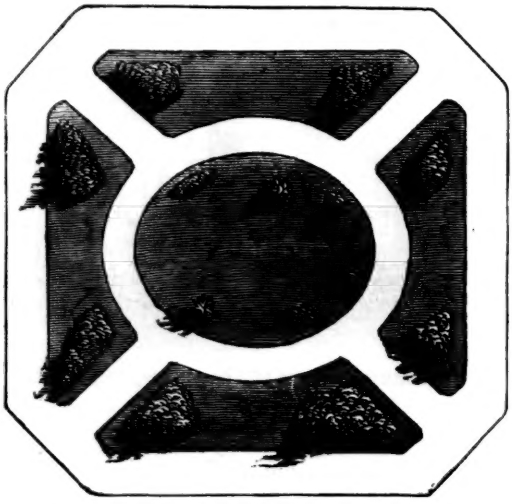
Structure in centre of a London Square, 1870.

is thus fixed on the contemptible objects in the centre, an agreeable spread of turf is made impossible, and one cannot feel the beauty of the trees or shrubs.

It is most unwise to desire uniformity in any art, but if there is one principle which deserves being engraved on the mind of every person who has the care of one of these squares, it is that the true way to obtain the best effect is by keeping the centre open and grassy, untortured by walks, hedges, or beds. By leaving the centre open and working in all our flower and tree beauty round the margins, we may in these small spots of ground make pictures to charm every beholder. The arrangement I mean will be seen at a glance in the following plan of a small square. It is by no means given as a model, but simply to explain the principle. The fringes of the central lawn might be planted in as varied a manner as possible. In large squares the form of the lawn need not be regular as in this case. But it is only when the good effects of the sweet fresh lawn in the centre are seen that its excellence can be appreciated; a plan cannot show it.

The gardening in our squares is of a peculiarly lugubrious description, and of a style quite apart. Hardy subjects are not made a study of, and the bedding plants with which the country is ablaze

in many parts, are rarely seen. Year after year the same tone of slimy melancholiness is assiduously preserved. The trees crowd upon each other, and only those that tower above all and assert their beauty and dignity in spite of the gardener, are seen to advantage. Any flowers planted usually soon perish in the solemn shade. The walks, generally designed so as to cut through and destroy the prettiest spots in the square, appear to receive most attention, but it is sometimes shared by the ugly, high, and elaborate seats piled round the bases of the beautiful trees so as to interfere with the effect of their stems as seen across the lawn. All the necessary seats, as well as tool-houses and arbours, should be placed near or towards the sides, where they would be useful without being obtrusive. It is quite easy to place all such objectionable features so that while as convenient as if piled up in the centre, they shall not be objectionable from any point of view; indeed, they need not be seen at all till required.



Plan of small Square, with grassy open centre.

The gardeners of the squares are a mysterious, not at all understood, race. Occasionally, an individual may be seen emerging from a public-house in the near neighbourhood pipe in mouth, and presently, gaoler-like, unlocking the gates of his gloomy retreat and disappearing within its shade. That is all we know of him, so we will pass him by for the present. Any beauty our squares possess is independent of their designers or care-takers. All present nearly the same dead level of feeble monotony. An idea, however, has recently been carried out in Golden Square, so original that it deserves an illustration, which will also save description. The materials employed have all the merit of simplicity—earth, old drain-tiles, and a chopping-block. If it be too much to hope for a system which would beautify our squares, may we not pray for a public inspector with power to remove any objects that make them resemble the playgrounds of lunatic asylums?

The best feature of the London squares are their noble trees. Driving or walking through the north-western districts you frequently come upon Planes which would command admiration in the largest forests! Huddled together, at first, with a number of miscellaneous trees, these, thanks to their splendid constitutions and noble stature, towered above the masses of overcrowded shrubs around them, and spread forth their grand old boughs so freely that each tree seemed as if it wished to fill up the square. Free from disease, regardless of dust;—asleep, but how very beautiful in sleep!—when the multitudinous fires are active around them in winter, these glorious trees give us in our dreary waste a glimpse of the beauty of the grand wild woods. And let it not be thought that the Plane is the only tree that would thrive perfectly in our squares, even in the most smoky and crowded parts! It would take a list longer than this article to enumerate all the beautiful deciduous trees and shrubs that grow in the temperate and colder regions of the world, and the great majority of which would do perfectly well in our London squares, if properly planted and attended to. It would be perfectly easy, even with our present knowledge, to select as many beautiful trees that would thrive in the squares of London, as would represent in them the brake and

Sketched in Golden Square, July 13, 1870.

forest beauty of every important cold region in America, Europe, or Asia. To select such trees and shrubs and plant them, so as to secure to each a due amount of light and air for its development, would prove a very desirable occupation for those interested in our squares.

The few kinds that have raised their heads above their fellows eloquently tell the advantage of paying chief attention to the planting of hardy trees. Here, for instance, is a peep into Lincoln's Inn Fields, which may help to show some of their beauty. This square, fortunately, is not cut off from public view on all sides by miserable masses of Privet and crowded Lilacs, and here and there isolated trees are seen that would be remarkable around our finest and oldest country seats.

It is utterly impossible to give an idea of the islets of lovely and brilliant flowers into which our squares could be made by this plan. The system of planting evergreens should on the other hand be discontinued, except in the case of a few kinds in suburban and open squares. The best plan would be, with all the evergreens annually purchased for London planting, to make a gigantic bonfire on the 5th of November every year. Many of them being of a resinous nature, they would afford the boys a very satisfactory blaze. We should in this

way effect two objects—save our squares from being defiled by the soot-begrimed dying evergreens, and spend at the same time the large sums of money which people will persist in throwing away on evergreens every year.

One noteworthy way of producing variety would be the devoting of one square to the trees and shrubs of a particular country; one, for example, might have British trees and shrubs alone, another American trees, another Chinese and Japanese trees and shrubs, and so on. The greatest improvement that could be effected in the London squares would be the intelligent planting of hardy trees and shrubs; an improvement, moreover, which could be carried out at a compara-

View in Lincoln's Inn Fields, June 1870.

tively small cost. It would be permanent too, and permanence in these matters simply means saving of constant trouble and expense. But there is no reason whatever why the squares should be devoted to hardy trees and shrubs alone. On the contrary, the best way would be to allow much latitude, so as to secure variety. When our municipal bodies begin to understand the management of city gardens, one of the first principles they will discover is that each square and small garden should differ as much as possible from its neighbours. Some of the suburban squares might be devoted to that ever-green vegetation which cannot be grown in the central parts; some in all parts might be gaily decorated with bedding and fine-foliaged plants, others chiefly with hardy border and spring flowers; one might even be devoted chiefly to rock plants, and so on. But

nothing of this kind could be attempted unless all or most of the squares were under one responsible head, who could determine what was best to do in each case, and select a man acquainted with the special branch to carry it out as well as possible. As arranged at present, all the squares are managed almost exactly alike. How to unite them under one responsible and efficient chief or department, it is not my object to point out; at present it may be impossible to do so, but assuredly we shall never know how much our squares are capable of pleasing and instructing us till a reform of this kind is effected.

Of the opening of most of our squares to the public I have said little, but those who have seen the happy crowds who frequent the sparkling little squares in Paris, will probably consider this an important aspect of the question. Private interests and public prejudice may be against it now, and may long continue so, but I have no doubt that in the interest of all it is the true plan. It will yet, I trust, be adopted in all parts of London, as the advantages enjoyed

View, from exterior, of a small Square.

by those who "possess keys" are surely not such as need prevent their offering the boon in question to the poorer inhabitants, many of whom perhaps seldom have an opportunity of seeing more of nature than is visible in the streets of London. Once devoted to public use, and under intelligent supervision, a modest allowance from the public purse would suffice to convert the squares into some of the most beautiful gardens that ever refreshed the spirits of man. They would save many from the attractions of the public-houses, which are now permitted to flaunt their destructive allurements at every corner. No part of a city should be without places where persons might meet and talk and rest in the open air. In continental cities, what with the seats along the tree-planted boulevards and squares, this is quite possible, but how very different in London. With us men are literally driven to the public-house, and public-houses necessarily with us assume an importance unexampled in any other country—forming, indeed, the chief features in our street scenery. The squares would, also, even if they did nothing else, help to save the nation of London children from the gutter. An important subject in connection with

squares and city gardens, is that of playgrounds. No system of city gardening can be good which does not meet this want. It is not enough to have open spaces or beautiful little gardens; we should keep the children from the filth and dangers of the crowded streets. The best way, in the case of all large cities, is to have, as far as possible, squares or open spaces arranged as playgrounds alone. These should, as a rule, be unplanted, except with large trees, so that nothing could interfere with the sport below. This plan would have the effect of drawing off the most frolicsome and noisy elements from the garden squares, and leaving them quiet, and almost free from danger of damage. As a rule, no playground should be made in a garden square. The smaller class of square would do best as playgrounds, and there are not unfrequently in large cities open spaces which, with a trifling expense, might be made into recreation grounds of this kind.

The numerous old cemeteries in all parts of London would, if properly embellished, prove as useful as any squares of similar size, and some of the large suburban cemeteries, now so much surrounded by London that they must soon be closed, would make excellent public gardens. To no other use should they be put, and it is in nearly all cases quite practicable to make old cemeteries into pleasant city gardens without removing the monuments, and thereby destroying the associations of the spot. All such places should be religiously preserved for ever to the public.

Since writing the above, I have visited most of the great cities in the United States. They have few squares, and these very badly arranged, and I am more than ever convinced of several things—first, that London is even now better provided with squares than any other large city; secondly, that these squares are managed so as to conceal any beauty of which they are capable; thirdly, that by a system, some of the main features of which I have endeavoured to indicate, these squares would become beautiful in themselves, and have the most beneficial effects on the aspect of many parts of London.

W. Robinson.

METROPOLITAN LOCOMOTION.

It has been alleged, that improvement is only a contingency of human nature; that the restlessness of man is acquired, not natural; and that his prevailing disposition is to satisfy his physical wants and then repose. Whether or not this be so, it would appear that, once set in motion, his mutations are interminable, and there seems to be no limit to his inventions. In relation to travelling and its facilities, it may be said with truth that "the appetite grows by what it feeds on," that supply and demand act and react upon each other, and that the prescient saying of Edward Pease, of Darlington, applies, more or less, to all improved means of locomotion, "Let the country but make the railroads, and the railroads will make the country." Carry persons or commodities quickly, safely, and at a moderate cost, and a carrying

traffic will be created where it did not before exist. As regards persons, a new sense and fresh desires are brought into existence by facilities for travel; and in no part of the world probably is this more remarkably apparent than in the great metropolis.

In London, as elsewhere, there are different classes of travellers, and various modes of locomotion; the classes may be broadly divided into the residential, the business, and the pleasure travellers; and the modes of locomotion, into the pedestrian, by steamboat, by railway, by cabs and other spring carriages; and by omnibuses, including tramway cars, and the omnibus that now plies daily under the bed of the Thames. The tramways and the Tower Subway are the most recent novelties in locomotion, and the beginning of systems that are certain to be extended; they are worthy of particular attention, and to this subject we propose to direct the reader's attention in the following article.

Of the *residential* passenger traffic, into and out of London daily, it is impossible to treat, unless it be in connection with the railway system. The one would be impossible without the other. The railways have in the course of the last thirty years doubled, at least, the area of the "province of houses" known as London and its suburbs. The population of London proper, or the City and the parts adjacent, have diminished during that time; and the population of the suburbs in Middlesex, and in the other metropolitan counties of Essex, Surrey and Kent, have been greatly increased. The census of 1871 will doubtless make some remarkable disclosures on this point; but reverting to that of 1861, as compared with the census of 1851, we find that the increase in the population of the greater portion of the metropolis situated in the county of Middlesex, was 16 per cent., whereas the increase in the population of London lying to the north of the county of Surrey, was 20 per cent.; and of the portion situated in the north-west corner of the county of Kent no less than 44 per cent. In the course of the last ten years, the increase in the population of the metropolitan portions of these two counties has been in a much higher ratio.

Prior to the introduction of railways, the boundaries of the metropolis were coterminous with Kensington and Paddington on the west, and Bow and Rotherhithe on the east, with Hampstead and Highgate on the north, and Clapham and Brixton on the south; the area occupied by what may properly be designated metropolitan suburbs, is now greatly extended beyond these localities, particularly in the directions south-west, south, and south-east, in Surrey and Kent. Every morning there arrive in rapid succession, at the London termini of such of the companies as cultivate and accommodate a residential traffic, a number of heavy trains filled with passengers whose vocations bring them to London daily. Tens of thousands, who thus constitute the day population of London, pass outwards again in the afternoon and evening, radiating to every point of the compass, to the respective localities in which they have their homes, and where they will be numbered next year with the sleeping population of such places. To Bishopsgate Station the Great Eastern brings every morning its living freight from localities in the directions of Brentwood, Epping,

Waltham, and Enfield. At the Broad Street Station hosts arrive every morning from Barnet, Watford, Harrow, Edgeware, and parts interjacent. The local metropolitan traffic of the Great Northern and Midland companies is forwarded from King's Cross to Moorgate Street, and the City traffic of the Great Western from Paddington to the same station by the Metropolitan system. The South Western brings its thousands daily from districts farther off, and from Brentford, Kew, Richmond, Kingston, Twickenham and Epsom; who, if bound for the West-end or the City, are forwarded by the South Eastern Company either to Charing Cross or Cannon Street Station by changing trains at Waterloo Junction. The Brighton and the London, Chatham and Dover companies carry their large daily contributions from and to some of the most charming localities in the county of Surrey; the one giving the choice of the West-end Victoria Station or London Bridge, the other of Victoria or more central localities, including a City station at the foot of Ludgate Hill. The South Eastern also taps rich and growing residential districts on the North Kent, Mid Kent, and main lines.

The residential traffic on the lines to the south and south-east mark the marvellous increase in metropolitan locomotion in that direction within the lifetime of the present generation. The London and Greenwich Railway was the first line opened, partly in 1836, that had a London terminus. Its commencement and the circumstances connected therewith are interesting, as furnishing materials for comparison, or rather for contrast, between "then" and "now," as touching metropolitan locomotion. How far the projectors must have been from a conception as to whereunto this thing would grow, and as to what railways would become! It was naïvely stated concerning it, that it is "constructed in a form which will render it, as a work of art, one of the greatest ornaments of the metropolis." This work of art is a viaduct of brickwork; for it contains 1000 arches, of 18 feet span, and 22 feet high. It was also stated that the directors looked to an exceptional source of revenue, of the same character as that earned by the old Thames Tunnel as a show. "More than 3,000,000 persons," it was said, "foreigners and others, visit London every year, on pleasure or business, and it may be considered a thing of course that a very large proportion of these will visit the railway at least once during their stay." The line was actually made a show of, with the accessories of music and "special attractions." At the Deptford Station, amongst others of the objects shown to "draw," was a wonderful naval war engine of the torpedo genus, the *Scorpion*, 80 feet long, invented by the late Earl of Dundonald. The managing director of the line was attended in his movements with a degree of pomp and ceremony not enjoyed by his successors, the managers of systems now embracing above 1000 miles. He arrived at the Deptford Station in his private carriage, and, having taken his seat in the train, the bugler who accompanied it struck up "See the conquering hero comes," keeping up the lively strain till the London terminus was reached. But the shows, and the continuous rows of lamps along the line, and the "conquering hero," were soon felt to be unnecessary, if not ridiculous, and were abolished. During the

first year the line was opened, the average number of passengers carried was 1300 a day.

Such are a few particulars touching things as they were, let us see how they are now. At Spa Road Station, on the Greenwich line, the iron road has been widened four times, and the whole of the trains of the South-Eastern system, part of the Brighton trains, and all the South London trains, now pass that point. The number of trains that passed Spa Road Station on the way to London was originally two in the hour, it is now sixty between eight o'clock and ten in the morning. The number of passengers carried then was on the average 1300 for the entire day; it is now, by the South Eastern alone, above 12,000 in the two hours referred to,—a number that would require 600 coaches, with nineteen passengers and a driver, or twenty persons to each, for their conveyance, and, if four-horse, would require 2400 horses actually working them, with relays in the stables. These coaches would make an unbroken line of above two miles in length; and the passengers by the Brighton and South London, not taken into the account, are probably nearly as many.

We may here dismiss further consideration of residential traffic with the remark that without the railways it would not have sprung into existence, except to a fractional extent, and its conduct would be simply impossible. It is worthy of note, that in 1837 the Queen ascended the throne; in that year also the London and Greenwich line was opened throughout, and in the year following the London and Birmingham line: the one short line (the Greenwich), was the first portion opened of a system that has extended from 4 miles to 346 miles; from 400,000*l.* of capital to above 19,000,000*l.* sterling; the other line of 111 miles, with 2,500,000*l.* of capital, is now absorbed in a system of above 1500 miles, with upwards of 70,000,000*l.* of capital.

As it has been with residential traffic so it has been with travelling for *business* purposes; the railways have called the one into existence, and have been creative, to a great extent, of the other. The rapidity with which raw materials and manufactured products can be conveyed by railway from place to place, and with which orders can be taken and executed, practically increase production; the great saving of time, and the difference in the amount of business that can be transacted in a given time, by railways and other facilities for travelling, virtually add to men's lives. It would be trite to dilate on the advantages of the railway system to trade and commerce, or to expatiate on the marvellous increase in our manufacturing and mercantile prosperity that has resulted from the railway system. Every one agrees with Dr. Lardner in the opinions he expresses on the influence of improved means of transport upon trade and commerce and civilisation. "The art by which the products of labour and thought, and the persons who labour and think, are transferred from place to place, is, more than any other, essential to social advancement. Without it no other art can progress. A people who do not possess it cannot be said to have emerged from barbarism." Lord Macaulay, in the same strain, says that "of all inventions, the alphabet and the printing-press excepted, those inventions which

abridge distance, have done most for the civilisation of our species. Every improvement of the means of locomotion benefits mankind, morally and intellectually, as well as physically." It will be more to the purpose in dealing with metropolitan locomotion to show what has been done, and is being done, or is proposed, to improve in London the means of transport of persons and products. Before doing this, a few words may be said concerning the third great class of travellers.

The travellers for *pleasure* are, speaking of the mass, a class also brought into existence by the railway system, which can alone appease the appetite it has created. Whatever other advantages may have been enjoyed in what have been called "the good old times," it must be admitted that the existing generation is cast upon a brighter and better time, in so far as locomotive facilities are afforded to workers of all kinds and grades, for spreading themselves over the country when a holiday affords opportunity for laying aside the work-a-day harness. The holiday excursions of the olden time were restricted to a small number of places, at short distances from home, and were indulged in by a limited number of persons. Now, however, abundant facilities are provided by our railway companies for excursions, which, from the metropolis, take all directions, and include a large number of very attractive places of resort. Christmas, Easter, and Whitsuntide, are the three great festivals of the bulk of the English people—the oases in the year of toil, and it would be ungenerous to impose rigid conditions as to the mode in which these periods of relaxation are to be spent. The upper class, and many of the middle class, can choose their own times for holidays; but the industrial classes can only depend upon these seasons for a run from home. In the days when George IV. was King the holidays were observed in a very different manner from what prevails now. To the great mass of the people, improved means of locomotion afford opportunities not enjoyed by the last generation for physical and intellectual relaxation, and, we dare to say, moral development and amelioration. The time has been, even in the life of the present generation, that the great mass of countrymen knew nothing of "town," and Londoners knew nothing of country. Places twenty miles distant, and the occupations and habits of the people dwelling there, were as much *terra incognita* as Chinese Tartary and its inhabitants. The railways and holiday excursion trains have not converted all rural, suburban, and urban toilers into travelled savans, but they have been the means of enlarging and correcting the conceptions concerning men, manners, and places of millions of persons, and have done much as teachers of topography, within a limited range, and in dispelling such grotesque crudities as that Scotland is a town, and Lancashire a village, the inhabitants of which are personally known to one another. Hosts of the dwellers in London take advantage of the facilities for travel which are thus provided; and it is well that for a few week-days in the course of the year the working men of London should have opportunity to escape from their everyday toil; that they should learn, in so far as a holiday trip can teach them, that London, vast though it be, is not the world, or its atmosphere, or thoroughfares, or streets, or bridges, or docks,

or public buildings, the purest, greatest, or best objects on God's earth. The improved means of locomotion at holiday and other times that have thus been taken advantage of by the working classes of London, and others, have revolutionised for the better the recreations and amusements of the people. The Easter fairs—barbarous relics of "the good old times!"—have almost entirely disappeared. The Easter fair booths have, of course, gone also. The railway trips have had much to do with the abolition of suburban fairs. The Crystal Palace, with its humanising influences, has almost entirely superseded them, with its vast and varied attractions, among which peasants and philosophers and all sorts and conditions of men may meet with what is fitted to interest, amuse, or instruct them. On a Good Friday, or other popular holiday, the railways convey as many as 40,000 to 50,000 persons to this favourite place of public resort. It is computed that in the Easter week of 1870 the railways having London termini conveyed as many as 350,000 *extra* passengers; the Metropolitan, the North London, the South Eastern, and the Brighton companies taking the largest shares of the extra special traffic. The other companies also carried large numbers of extra passengers, many of them to distant attractive localities, on the coast and inland, in all directions, at reduced fares.

Concerning the kinds of locomotion in the metropolis but little need be said as to the primitive mode—the *pedestrian;* excepting this perhaps, that London pedestrians run the risk, as about fifty to one, of being run over in the streets, that they do of being killed by railway accident, from a cause or causes beyond their own control. In one year 200 persons have been killed by horses and vehicles in the streets; in one week five persons have lost their lives in this way, or at the rate of 260 per annum. But it is using the language of an alarmist to write thus, even 203 is a shade above the average, or "expectation." In one of the recent reports of the Registrar-General he states that "the expected number of deaths by horses or vehicles in the streets is 74 in 19 weeks; the actual numbers registered in this year are also 74. Seven persons were killed by horses, 2 by carriages, 4 by omnibuses, 10 by cabs, 22 by vans or waggons, 28 by carts, and 1 person was killed by a dray. The actual numbers recorded to the 8th of May amounted to 66, the calculated number to that date was 70." Eight deaths instead of four occurred in the last week, and the law of averages was vindicated.

This circumstance reduces the question to an absolute form, as regards the number of lives lost because of the perils of the streets. It is a simple rule of three sum, if 19 weeks give 74 deaths, how many deaths will 52 weeks give—answer, $202\frac{10}{19}$. Dropping the fraction, it must surely be considered a terrible thing that as many as 202 persons should be crushed or trodden to death in the streets of London every year. Surely some remedy should be attempted, at least, for this great evil. Widening the streets, and the opening up of new thoroughfares, is of great advantage to the vehicular traffic, but it is of little service to the pedestrian, especially in the city. The crossing at the foot of Ludgate Hill, where it intersects New Bridge Street and Farringdon Street, is now, in fact, since it was widened, more dangerous

to foot-passengers than it was before, from the uncertain sweep taken by vehicles turning from the one line of street into the other.

Mr. William Haywood, C.E., Engineer to the Commissioners of Sewers, gives the number of persons crossing at this intersection of streets, as from each of the four points to one of the other three, at 37,075 in the course of nine hours. At the intersection of Gracechurch Street with Cornhill and Leadenhall Street, 28,080 cross in nine hours; and at the intersection of Lombard Street and Fenchurch Street, 30,390 in nine hours; at the junctions of streets around King William IV.'s monument, King William Street, City, 42,395 cross in the nine hours; and in the bewildering whirlpool between the Bank and the Mansion House, 56,235 persons cross in nine hours. These crossings are the most dangerous portions of the London streets. There are pedestrians who have sufficiently cool nerve, keen eye, and sure foot, to get across Cheapside even in the busiest hours of the traffic; the aged, the timid, and the infirm, do not attempt this, and they are naturally appalled by the crowded crossing! It is true, they have the help of the policeman on duty, and these men discharge their functions well, sometimes at the risk of their lives. But the traffic, constantly increasing, is getting at some points beyond the power of the police to control, and it may fairly be demanded of the City authorities that they should provide, by subways or by bridges at street crossings, means of passage that would give comparative immunity from damage to life or limb, by hoofs or wheels, to all who choose to take advantage of such provision.

Touching the next mode of travelling in the metropolis and its suburbs—the river *steamboats*—there is not much to be said. Great improvements have been made along the Thames Embankment in the convenient landing-stages that have been substituted for the boarded barges that formerly did duty as piers. The landing-stages are not to be complained of; the boats, or their managers, however, appear to be of a conservative turn, and they have for many years remained unaltered in dimensions, decorations, and general character. They are not likely to compete successfully with the Underground Railway to Westminster, or even with the pleasant foot-walks along the Victoria Embankment. The proprietors of the boats have had ample time, with forty years' experience at least, to have provided a much superior means of conveyance. Steam power was applied to navigation at a much earlier date than to land locomotion. In 1815, two steam-vessels—the first—were built in England; in the next five years, sixteen; and thereafter in each year numbers considerably higher until 1836, in which year forty-three steam-vessels were built in England, of 5924 tons, and twenty in Scotland, of 2834 tons. In that year there were 600 steam-vessels, of 67,969 tons, belonging to the British Empire. The juniors of "the oldest inhabitant" remember the time when the water-passage between London and Woolwich was made mainly in dependence on the tide; but though the steamboats from Woolwich and Greenwich, as well as those above bridge, had the start of the railways by a good many years, the railway companies of London have left the steamboat companies far behind.

Something has been already said concerning the chief mode of

metropolitan communication by *railway*, but much more might be added concerning the marvellous rapidity with which railway schemes have been developed in the metropolis, and the elaborate ramifications and imposing magnitude to which they have attained. In connection with the railway system of the United Kingdom, it may be mentioned that Mr. Porter, in his 'Progress of the Nation,' arrives at the conclusion that, in 1834, one-fifth of the able-bodied, adult population, excluding infants and the infirm and aged, or 2,000,000 persons, travelled by stage coach; and he remarks, that "this places in a strong point of view the activity which pervades this country." How much more conclusive the evidence of activity and enterprise now, if it is to be judged by the number of travellers! In 1868, the latest year for which returns have been published, there were issued in the United Kingdom 304,136,334 day railway tickets; and there were also issued by the railway companies 143,485 season tickets. Allowing only 100 journeys for each season ticket, the journeys amount to a total of 318,484,834—an increase to which the metropolis has largely contributed.

Reverting again to the South Eastern system, and to Woolwich and Greenwich, as illustrations (not peculiar to the South Eastern) of progress, and of the benefits conferred by railways upon the community, a few facts may be mentioned. The steamboats were at first regarded with great distrust, and until the railway was opened the "Tallyho" and "Royal Sovereign" stage coaches kept the road. Passengers from Woolwich, to catch these coaches at Greenwich, came by van, fare 6*d*. The proprietor of the van considered time no object, at least to his passengers, and waited, sometimes for an hour, until he had a paying load. When Greenwich was reached the passengers had to encounter the risk of the places being all filled; if otherwise, they were taken at fares of 3*s*. inside, 1*s*. 6*d*. outside. If time was indeed an object, passengers, if they were equal to the distance, could often save it, and the fare, by walking. At that time a journey to London, business there, and the return, made up a full day's work. Now tradesmen and others make, occasionally, two and more journeys to London and back in the day. Against the cumulative 2*s*. fare from Woolwich, above referred to, the South Eastern Company has for a considerable time run, without being under statutory obligation to do so, workmen's trains from Plumstead to London—a double journey of twenty-four miles, for 4*d*. These workmen's trains—a special feature of metropolitan locomotion—are run by several other companies at very low fares, and are a great boon to working men, in enabling them to live in better houses, and more healthy localities, than they could otherwise command, and at lower rents than they would have to pay in London.

The growth and progress of London have been estimated in various ways—by population, inhabited houses, rateable value of property, and otherwise. There is no evidence of its progress more remarkable than its increased and improved means of locomotion, its railways and railway junctions and railway stations constructed since 1837. In that year the population of the metropolis was about 1,750,000, it is now probably about double that number, or 3,500,000; but the

increase in the number of travellers is far in excess of that proportion; it is much more than tenfold the number of travellers in 1837.

The companies first formed, which conveyed their passengers from distant localities, stopped short, timidly, when they got near to the metropolis, as if afraid to penetrate it. The London and Birmingham line was originally designed to have its terminus at Camden Town, a much less populous and densely built quarter then than it is now. The promoters took heart of grace, however, and took also the run down the incline to Euston Grove, a formidable engineering feat in those days, but a bagatelle as gradients go now. Since then, the London and North Western has pushed its way to Broad Street, in the City proper. On the opposite side of the river, the London and Southampton, now the London and South Western, opened in 1838, stopped short, well up the river, at Nine Elms, but has since crept citywards to Waterloo, and more recently has secured access to Charing Cross and Cannon Street Stations by interchange at the Junction Station. The South Eastern, which had its terminus for many years on the Surrey side of London Bridge, has crossed the Thames by costly works at two places, to reach the heart of London and Westminster. The London and Bristol line, now the Great Western, was long contented with its terminus as far west as Paddington; but is now, practically, by connection with the Metropolitan, extended to Moorgate Street Station, at which the Great Western Company delivers such of its passengers as may desire to go thither. The London and York, now the Great Northern, has, like the Great Western, taken the advantage offered by the Metropolitan system, touching, as it does, its terminus at King's Cross, to join the Underground system, for the conveyance of its residential and business passengers to Moorgate Street. The Brighton, with its terminus at first at London Bridge, has now a terminus at Victoria, on the edge of Belgravia, with an omnibus line between London Bridge and Victoria Stations. The London, Chatham and Dover (a new-comer) boldly dashed at once into the City, and forks off also to Victoria Station at the West-end. The Midland—designed, as its name would imply, to provide railway communication for the counties of Derby, Notts, Leicester, Stafford, Warwick, Northampton, and a few others—gradually extended southwards, through Beds and Herts, and at last cleared the gap between it and London by a bound from Bedford, from which it made a line to St. Pancras and Moorgate Street Stations, the latter by junction with the Metropolitan. The Great Eastern has still its head-quarters at the Bishopsgate, sometimes called the Shoreditch, Station; but the company has parliamentary powers to provide a new station, in conjunction with the East London, at Liverpool Street, which will doubtless be completed.

These extensions, numerous and important though they be, scarcely convey an adequate idea of the facilities for transfer from one railway system to another that have been provided in London within the last few years. In 1864, a joint committee of the Houses of Lords and Commons recommended the construction of an "inner circuit of railway" in the metropolis, "with a view to the distribution of the passenger traffic arriving by the main lines of railway coming within

the metropolis, and also to relieving the crowded streets by the absorption of a large portion of the omnibus and cab traffic." The joint committee also concurred with the opinion of the House of Lords' Committee of 1863, and in the recommendation that an outer circle of railway communication should be constructed "by uniting the railways on the eastern side of the metropolis with one another, and connecting those of them which are situate on the north side of the Thames with the railways on the south side, making use for this purpose of the Thames Tunnel." At that time railway speculation and engineering enterprise were rapidly rising to the top of one of the flood-tides that have ebbed and flowed at irregular intervals ever since the commencement of the railway era. Two distinct elements conspired to guide the stream of scheming activity into a special channel—the provision of increased facilities for the conveyance of passengers and goods from one point to another in London and its suburbs at a profit, and this to the relief of the overcrowded and often impassable streets. The legislature, the City and municipal authorities, and the public generally, had become anxiously concerned, as they continue to be, by the great and growing difficulties and dangers incident to the daily street traffic of the metropolis. It had been ascertained that above 750,000 persons entered the city of London every morning and left it again every evening, and that 60,000 vehicles entered the City every 24 hours. The persons thus moving daily in the City would make, shoulder to shoulder, a double rank 120 miles long; and the vehicles, close drawn up in line, would reach from London to a point 50 miles north of the city of York.

The reports of the joint committees of Lords and Commons acted as a powerful stimulant upon the spirit of enterprise, then buoyant even without stimulation. The response of promoters and engineers was startling, and caused consternation and alarm. The Lords' recommendations of an outer and an inner circuit, reported in 1863, were of course public. In 1864, petitions, sections and plans, and books of reference were deposited for 32 railway bills affecting the metropolis. They were for the construction of 174 miles of railway in the metropolitan district, at a cost of 44,000,000*l.* sterling, in share capital, and loans; exclusive of the property "beyond the walls" they scheduled one-fourth of the entire area of the city of London! The engineering works included no less than four new bridges over the Thames, two of them high level, of gigantic dimensions, below London Bridge.

Of the 174 miles petitioned for, the construction of 20 miles was authorized; the schemes sanctioned including the East London, to complete the outer circuit, and extensions of the Metropolitan and Metropolitan District lines to complete the inner circuit. The actual performances on works then authorized are a curious commentary upon the number and magnitude of the schemes for which parliamentary sanction was asked. It is true that, of late years, "financing" schemes has been a harder task than engineering or constructing new lines and works; it is, nevertheless, to be deplored that, in relation to the important connecting-links of railway com-

munication sanctioned in 1864, the completion of the one should be postponed indefinitely, and the attempt to complete the other abandoned. The one—the East London—is all that remains to complete the outer circle; this line has been opened from Wapping to a junction with the Brighton at New Cross. It is intended that it is to have junctions with the South Eastern also on the south of the Thames, and with the Great Eastern and the North London on the north. To accomplish this, the company has the difficult work in prospect of passing under the London Docks, and it is to be feared that a considerable time may elapse before these works can be executed, and the outer circuit joined up. With the exception of this short gap it is now complete. When finished, this line will connect the east, north, and north-west of London by the Great Eastern, the North London, and the London and North Western, with the South Eastern and Brighton systems. The remainder of the outer circuit is completed by the North London, the West London, and the South London lines. The Willesden and Clapham Junctions and the West London line provide connections between the Great Western and the London and North Western on the north, and the South Western and other systems on the south of the Thames. The North and the South London lines are mainly used as omnibus lines, deriving their revenues from very heavy and remunerative residential traffic. Touching the inner circuit, the whole of which has been authorized some five or six years since on the petitions of the Metropolitan and the Metropolitan District Companies, it is now certain that the circuit will *not* be completed by these companies. The Metropolitan Company, indeed, which is under legal obligation to complete its portion, is held by Parliament, rather tyrannously, to the obligation, and they must continue their line to Tower Hill, which will in time be executed. The Metropolitan District, on the other hand, are not under any obligation to continue their part of the circuit to Tower Hill, and a gap will be left, for the present, from that point to Queen Street, Cannon Street. Considering that the Metropolitan is not to meet the Metropolitan District at Tower Hill, and that the complete circuit is not to be made, the compulsion put upon them to make the costly, and hopelessly unremunerative section between Aldgate Street and Trinity Square seems a hard measure.

The Metropolitan line is, in the meantime, doing wonders, running more trains, carrying more passengers, and earning more money per mile than, probably, any other railway in the world. On one of the holidays of 1870 as many as 1111 trains were run in the course of the day, and 170,441 passengers were carried, all in perfect safety—a notable illustration of the forethought, care, and skill, that must be exercised by Mr. Myles Fenton, the manager, and the associated officers and men. At Moorgate Street Station, on the Metropolitan system, the ordinary day's work includes the receipt and despatch of as many as 663 trains and engines in a day. In one hour in the morning 25 trains enter, and as many pass out of the station, the intervals in some instances being not more than a minute in trains following each other, which they do with perfect confidence, the block system

of working being rigidly adhered to, by which the driver of an engine is assured by signal that a certain distance in front is clear.

The reference before made to the lines that have been extended to the City of London and to Westminster can only convey an inadequate idea of the extension in and around London of railway accommodation. The London Bridge, Euston Grove, and Nine Elms stations of 1838 have grown to nearly 300 stations in the Metropolitan district. Above three-fourths of these are within five miles of Charing Cross. Seven of them are within the walls of the City of London, and other five stations within the City are authorized, but not likely to be erected for some time to come. If the different companies having right of user of London stations is taken into account, the number of stations in London and its suburbs is, practically, in round numbers, not far short of 1000—a wonderful advance upon the three of 1838!

Concerning the next mode of locomotion by *cabs*, and other spring carriages, what can be said? This, perhaps, that those who profess to know them best, like them least. But it may be feared that poor cabby is as much sinned against as sinning. He is regarded as a sort of Ishmael, and if his hand is not against every man, every man's hand and tongue, pretty nearly, are against him. This we do know concerning cabmen, that the superintendents of some of our large railway stations, "privileged" and non-privileged, who know cabmen thoroughly, are not to be found among their revilers. It is also within our personal knowledge that some of the finest examples of simple-minded, sparkling honesty, and right feeling, with which we are acquainted, have been the acts of cabmen, guided by naught else than their conscience and sense of right. "Cottages on wheels," the decayed carriages of the nobility, were in use in London as Hackney coaches at the beginning of the present century. Cabs, or cabriolets, were an importation from France about the year 1820. Hansoms, like the opening of the Greenwich railway, date from the year 1837, when Queen Victoria was proclaimed. For the rest, touching cabs, it may give some idea of the extent to which that mode of locomotion is used to say that since 1853, when there was a great strike among the cabmen, the vehicles licensed have increased from 3200 to nearly 7000, the working of which require above 13,000 horses, and the earnings from which maintain about 80,000 persons of all ages. In most cases 2 horses are required to work a cab, but the more affluent proprietors allow 2½ horses to a vehicle. There are 200 appointed cab-stands in the Metropolitan Police District, only 120 of which have water supply. More might be said concerning cabs and their drivers, who live very hard lives, and for the greater part manifest as great dexterity in the exercise of their vocation as any other class of the community. Although improvement in the character of the street vehicles has been slow, and there is still great room for improvement, it is undeniable that the cab service of London is better than it has been in past times, and it may be hoped that with the legislative relief that has been granted to the cab interest, further and greater improvements may speedily appear. Cabs, it may be known, are for the greater part hired by the drivers, at from 10*s.* to 20*s.* a

day for the vehicle and two horses. The driver is, in a general way, fortunate if on hire for half of the day; it is no rarity with him to have days in which the fares he takes fall short of the amount he has to pay as rent.

Another large class of London street travellers is the *omnibus* passengers. This description of vehicle has also an interesting history. About the beginning of the present century an enterprise was attempted in London of an omnibus service; the vehicles had six wheels, and were drawn by four horses. From want of capital, or of perseverance, the project failed, and the old hackney-coaches and stage-coaches ruled till the advent of the cabs in 1820. It was not till nine years later, in 1829, that the omnibus era commenced, curiously coinciding almost exactly with what may be called the commencement of the railway era, the first section of the London and North Western system—the Liverpool and Manchester—having been opened in the following year. The first of the new vehicles was started by Mr. George Shilibeer, on the 4th of June, 1829, and ran from the Bank to Paddington, *viâ* Finsbury and the New Road. Other services were added by Mr. Shilibeer, one by the great artery westwards, *viâ* Cheapside, Holborn, and Oxford Street; another from Greenwich to the West-end; and a fourth between London and Brighton, the railway not having been made as yet. It was not for want of will that the drivers of the hackney and stage-coaches did not "nurse" their successful rivals; they had not acquired the art in which the omnibus drivers of later days have become such adepts. Despite the objurgations of the old jarveys, the new vehicles rapidly grew in public favour, the omnibuses proving almost as great an advance upon the old coaches in certainty, celerity, and comfort, as the railways have been in turn upon the omnibuses. These omnibuses, which were unnecessarily heavy, were drawn by three horses, yoked abreast in the manner employed in some of the modern omnibuses of the best type, of which very few are to be seen in the streets of London, although they are common in Manchester, Liverpool, and Glasgow. Shilibeer was a man of liberal ideas and of taste; the conductors were polite, gentlemanly young fellows, gaily apparelled in velvet caps and jackets; the omnibuses were actually furnished with assortments of books for the use of the passengers, but the books could not be chained, like the bibles to the reading-desks in the churches in the olden times, and they disappeared, to the loss of the proprietor and the disgrace of those who pillaged the little libraries, and the supply of books had to be discontinued. The enterprise was not a financial success, but, like Columbus making the egg stand on end, Shilibeer had shown the coach proprietors how to do it, and they entered into keen competition with him and with each other, improving in their vehicles upon his example. After a few years of keen contest, in the streets and in the law courts, a number of proprietors combined to form the "London Conveyance Company," and the omnibus service became greatly extended, and, to a certain extent, systematized.

It is remarkable, that the stage-coach and omnibus business in London should have been prosecuted, with singular energy and

success, in several instances, by women; amongst others, by Mrs. Ann Nelson, of the *Old Bull*, Aldgate, mother of Mr. John Nelson, afterwards proprietor of the "Wellington" omnibuses. And, again, by Mrs. Wilson, of Holloway, whose omnibus, job, and post-horse "plant," including a stud of about 600 horses, was at one time worth from 40,000*l.* to 50,000*l.* The well known "Waterloo" omnibuses, again, were started by Mrs. Clarke, and have kept the southern route to Camberwell successfully from the time they commenced to run.

The omnibus service of London includes sixty metropolitan routes, and forty-four suburban routes, taken by omnibuses that start from the City or the West-end, for localities in some instances 8 or 10 miles distant. The service employs about 1200 vehicles and 12,000 horses. The "London General Omnibus Company" are the largest proprietors, and their accounts give particulars concerning the omnibus traffic of the metropolis, from which deductions may be drawn that could not be arrived at without such information. In the first six months of 1870, the London General ran 587 omnibuses on week-days, and 469 on Sundays; the gross receipts for the half-year were 268,215*l.* 15*s.* 5*d.*; the number of passengers carried was 21,417,533; the average receipts per omnibus per week were 17*l.* 7*s.* 10*d.*, or, per working day, 2*l.* 11*s.* 2*d.*; the average fare per passenger, 2·96*d.*; average earnings per mile per omnibus, 10·46*d.*; total number of miles run 6,055,150. Adopting these figures as data, it would appear that, in round numbers, the metropolitan omnibuses take about 1,000,000*l.* annually in fares; that they carry about 85,000,000 passengers, aud run about 24,000,000 miles, over about, probably, 350 miles of streets. The life of the omnibus drivers and conductors is even harder than that of the cabmen; and the day's work is as much, often, as 14, and even 16 hours a day of continuous duty. Their children, if they have any, they can only see between midnight, or after it, when they reach home, and 6 or 7 o'clock in the morning when they leave it. Their meals are snatched on the streets, often on the box during the few minutes required for changing horses. Throughout the long hours in which they are employed they have no rest. Each omnibus travels an average of 60 miles a day, made up, as drivers have informed us whose courses are about 5 miles in length, of "six there and six back," which gives the 60 miles. London cabs have not kept abreast of the age in improvement, but the omnibuses have lagged far behind. The London omnibus system, the largest in the United Kingdom, probably in the world, is one of the worst known, and greatly inferior not only to that of Paris, as Paris has been, but in strong contrast—to its discredit—with a number of the cities and towns of the United Kingdom. Many persons consider the service nearly obsolete, and never think of riding in an omnibus; many ladies—from the stuffy, uncomfortable state of the carriages, and their unpleasant motion—durst not use them, having acquired the experience that they will do so at the risk of being let down dead sick in the middle of the street, after they have travelled only a short distance towards their destination. They are a slow, uncertain, uncomfortable, often dawdling mode of conveyance—nasty, but not cheap, in many instances.

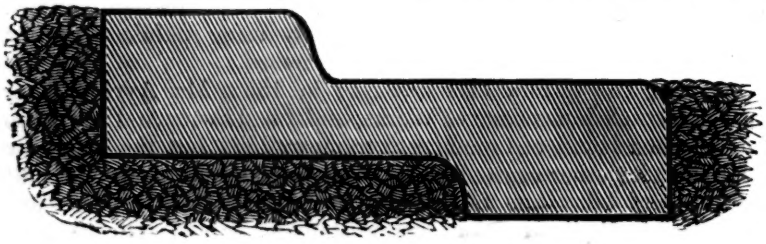
Street tramways, which are now in course of construction in various parts of the metropolis—in such localities and to such extents as will give them a fair trial—are likely to be to the omnibuses what Shilibeer was to the stage-coaches; to stimulate the proprietors to improvement, and in many instances to supersede their vehicles altogether.

It has been the misfortune of the promoters of tramways for the metropolis to have had that system of locomotion associated with the notorious Mr. George Francis Train, and the highly objectionable section of tramway he laid in Westminster, and in other localities in this country, about ten years ago, in which he adopted one of the worst patterns of the obsolete trams that had been used in New York, and have been long replaced by better forms. Tramways, in actual work and projected in this country, date from a much earlier period than Train's public appearances in England. From 1827 till 1839, when the railway was opened to Preston, a tramway was in constant use in that locality, which had, in parts at least, a grooved rail, and was crossed daily by the stage-coaches at Bamber Bridge, without accident or inconvenience. In 1830, a scheme of street tramways for Manchester was proposed, but failed to enlist a sufficient degree of support. In 1857, the directors of the London General Omnibus Company, impressed by the success of the tramways of Paris, Lyons, New York, Boston, and other cities, recommended to their shareholders the application of 50,000*l.* to the provision of a tramway from Notting Hill Gate to Fleet Street and the Bank, with numerous branches. In relation to that proposal, which for some reason was not carried out, the *Times* of November 28, 1857, stated that the directors, in adopting this course, were "acting upon a suggestion thrown out in this journal in August, 1856." Mr. James Samuel, the engineer of the omnibus company, made a strong report in favour of the tramway system, in which he stated that "all doubts as to the practicability of laying down and working iron tramways in the main thoroughfares of cities was set at rest." The new tramway omnibuses, he stated, would travel at a speed increased 20 per cent., and they would save 66 per cent. in dead weight; the facilities for stopping and starting the carriages would be greatly increased by the use of improved and powerful brakes; the tramways, it was alleged, would greatly abate the tear and wear on the roads; and two opinions, Mr. Samuel maintained, could not be held as to "the practicability of the scheme, and its advantage to the public." The London General Omnibus Company did not, however, lay tramways in 1857. In 1861 Mr. Train entered the field, and laid his lines of tramway, under arrangement with the local authorities, but without parliamentary powers. The result is well known: the superiority of his vehicles, and the increased comfort they gave to travellers, were admitted from first to last of the experiment, but the form of rail employed was radically bad. Practically it made a groove in the roadway of nearly 5 feet wide and about an inch in depth. Vehicles crossing it were violently jolted, those that attempted to cross it at angles, more or less oblique, had their wheels "hugged," their axles strained, and numerous and serious accidents resulted from Train's trams to horses and carriages of all kinds other than tramway cars. Train's lines were

in consequence cleared away, as nuisances, by a *mandamus* from the Court of Queen's Bench. That they were a dangerous obstruction to the ordinary vehicular traffic may be seen from the subjoined sketch of their form. It was not to be borne that a speculating company or firm should appropriate an important part of the public thoroughfares, to the serious damage of the community using public or private vehicles, and Train's rails were hence removed.

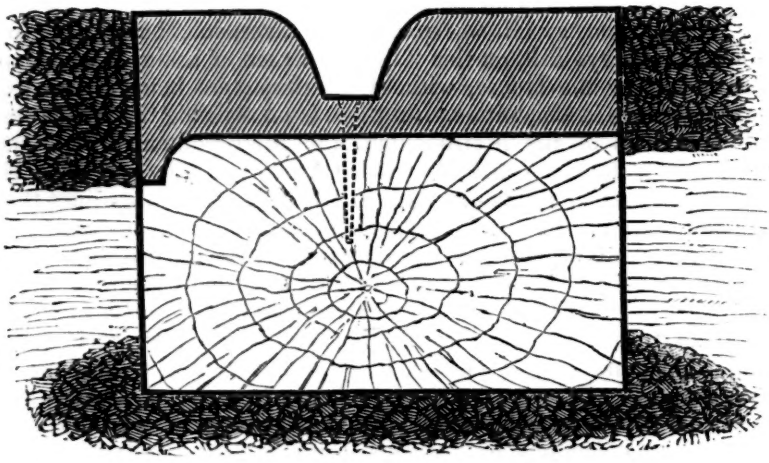
Pursuing the history of tramways; in 1862, Mr. Ayrton, afterwards Chief Commissioner of Works, and Sir Lawrence Palk, introduced, in the House of Commons, a tramway bill; but the lateness of the session, or other cause, prevented its being prosecuted. In 1865, two tramway bills—one for London, the other for Liverpool—were introduced in Parliament, and lost on standing orders. The same two projects were re-introduced in 1866, but again unsuccessfully; they failed on certain technical points, and their intrinsic merits were not inquired into. The standing orders of Parliament then in force left the matter dubious how tramway bills should be dealt with, and as to the class of bills with which they should be grouped. A special standing order was adopted to meet their case. In 1867, several tramway bills were again petitioned for, but again without success. In 1868, a tramway bill was passed for Liverpool; but the Metropolitan Tramways Bill, on this "the third time of asking," was again thrown out by the House, without the promoters being allowed to state their case in Committee. But there is no resisting the inevitable; the promoters of the Metropolitan, the Metropolitan Street, and the Pimlico, Peckham and Greenwich, tramway bills, pressed their respective cases, and obtained Acts in 1869. The tramway lines thus sanctioned are in course of construction, as also numerous important extensions, and new metropolitan lines of tramway authorised in the session of 1870. The section of tram that has been and that is being laid, is entirely different from Train's pattern, the objectors to which were not those who travelled in the cars, which were roomy and comfortable, and easy in motion, but the drivers and proprietors of other vehicles, who were exposed to heavy loss and damage by the break in the level of the road. The new pattern of tram obviates entirely the objections to Train's pattern, in that the level of the street is preserved, and vehicles of all kinds may pass over the trams, at any angle, without difficulty, danger, or risk of damage. When the attempt was made, in the House of Commons, to defeat the bills on the second reading, it was very properly urged that it was no valid reason against a good system of tramways, to argue that a bad system had failed. The trams now laid—not the best, possibly, that may be desired—are level with the road, and only break its surface by a groove so narrow that neither the wheel of an omnibus, cab, phæton, or even of a baker's hand-cart, can be caught in it. The tramway companies lay their lines and pave the space between them, and for 18 inches on each side, and are bound to keep this part of the road in repair, as long as their occupation lasts. The effect of this liability is that they pave their portions of the road, at heavy cost, with granite blocks. The cost of the double line of tramway is, we believe, somewhere about 10,000*l.* per mile.

As regards dead weight, the tramway system has very much the advantage compared with any other mode of locomotion. The advantage gained by the passenger, and the space saved in the streets, may be readily apprehended on consideration of the principles of



Section of Train's trams—half size.

construction of street vehicles. The ordinary omnibus is 7 ft. wide over all, 4 ft. 9 in. wide inside, and 2 ft. 9 in. wide between the seats. The tramway carriage is 6 ft. 6 in. wide outside, 5 ft. 9 in. inside, and 3 ft. 1 in. between the seats, which is a comparative gain



Section of trams as now laid in London—half size.

of 6 inches to the street, and 12 inches to the passenger. In the tramway cars there is a clear passage of about 20 inches between the passengers. The body of the ordinary omnibus is *within* the wheels; the body of the tramway cars projects *over* the wheels.

The resistance that has to be overcome in traction is an important element in the tramway problem. The tramways will meet with a formidable competitor, and the ordinary omnibuses with a potent auxiliary, in the *Val de Travers* asphalte cement compound, or top dressing, now being applied to some of the principal thoroughfares of the metropolis. The streets laid with this material offer little, if any, greater resistance than would be offered by an iron rail or a planed iron plate. The only defect of the new pavement seems to be that in certain conditions it does not afford foothold for the horses,

The remedy for this now applied is of a very equivocal nature, to cover the roadway with sand or gravel. The effect of this process is practically to make a dustmill in dry weather, and a mudmill in rainy seasons. The single desideratum in connection with this superb pavement seems to be that some gritty substance or material should be incorporated if possible with the cement, so as to afford foothold to the horses. If this could be done, and all metropolitan thoroughfares were to be laid with the *Val de Travers* cement, the tramways would be left out in the cold, and distanced in the race. But in so far as we know now, the tramways have decidedly the advantage as regards economy of horse life and suffering. In the tramway car the work of the horse is natural and comparatively easy, a straight pull by the collar, always in one direction; in the ordinary omnibus the horse has not the drawing alone to do, but has to do the much more cruel work of stopping the vehicle by the sudden and severe tug at the end of the pole, an effort that costs it much more than the straightforward pull. In the case of the tramway car the stoppage is by mechanical means. The horse, instead of having another set of muscles to bring into violent exercise, of having the collar lifted from its seat to the galling of the withers, has simply to relax the muscles in play, and rest until the brake has done its work, and the driver is again ready to go ahead. The tramway cars greatly surpass the omnibuses in the number of passengers they carry. As, for instance, in New York, over 63½ miles of road, about 79,000,000 of passengers were carried in 675 carriages, by 4830 horses: whereas in London, over 350 miles of road, only 43,000,000 of passengers were carried in the same time by the chief omnibus proprietors; and these took 582 vehicles for their conveyance, and 6677 horses. In New York each carriage conveyed 116,996 passengers; in London, 71,021. In New York each horse drew 16,348 passengers, in London only 6525. This marvellous contrast is not to be wondered at when the advantages of the tramway system are taken into account in relation to dead weight. The ordinary street omnibus weighs 25 cwt. and carries 26 passengers, or, with the guard and driver, 28 persons, or, at 14 to the ton, 2 tons. The tramway cars that commenced running, May 2, 1870, from Whitechapel to Bow, and from Kennington to Brixton, weigh 2 tons, and carry 70 persons, including the driver and conductor, or 5 tons of paying weight. The most favourable statement that can be made respecting dead weight in railway traffic relates to the traffic of a company, taken almost as the first that comes to hand, from which it appears that a train has an engine and tender of 35 tons and 14 carriages of 5 tons each, or 105 tons dead weight in all. The carriages when full will carry 280 passengers, or say, at 14 to the ton, 20 tons of paying weight. The passenger trains of another company have engines and tenders weighing 45 tons, and an average of 17 carriages and vans in a train, which weigh 85 tons, or 130 tons of dead weight to, say, 300 passengers, or 21 tons of paying weight, to 130 tons of dead weight.

Mr. Robert F. Fairlie, as regards dead weight and the general railway system, has conclusively demonstrated by his admirable double

bogie engines and combined engines and carriages, that railways and tramways may be constructed and worked at a profit that, under the existing system of hauling so much dead weight, can only be worked at a heavy loss. The adoption of his system would extend to localities, not now enjoying them, the advantages of the railway system and the facilities of communication which they need with other parts of the country, and in relation to existing companies would give them, by adopting this system, the means of paying a fair dividend. There is now no question as to the ability of Fairlie's bogie engine to work very steep gradients, to turn very short curves, and to do the duty generally of the engines that cost much more and haul much less, than it is equal to. It is satisfactory to know that although the railway companies of the United Kingdom have not as yet adopted the Fairlie engine, the Scandinavians and others have done so, and in the future we may expect to hear of its extensive use in connection not only with cheap railways, but also with street and road tramways.

The dead weight question is one of great importance as regards locomotion. It appears that the following are the proportions of paying and dead weight hauled by the three principal modes of public conveyance:—

	Paying Weight.		Dead Weight.
Tramways	5	to	2
Ordinary Omnibuses	5	„	3½
Railways	1	„	5

In this statement the case of the railways is given more favourably than facts might warrant. The tramways, it may be assumed, will carry with greater comfort, and by a smaller amount of horse power, and with other advantages, a much larger number of street passengers than are now conveyed by the London General or any other omnibus company, and will thus relieve the thoroughfares.

The tramway systems authorized in the metropolis include—a line extending from Woolwich, passing through Greenwich, Deptford, Peckham, Camberwell, Kennington, and over the Vauxhall Bridge to Victoria Station. This extensive system has, to the right and left, various junctions. On the south side of the river the Elephant and Castle will be a radiating point of the tramway system. From that point one line, *viâ* the Old Kent Road, will pass to Victoria Station; and junctions will also be there formed with lines to Camberwell, Walworth, and other localities south of the Thames. Clapham, Brixton, Victoria Station, and various other localities will be brought up to the south side of Westminster and Blackfriars Bridges; numerous loop-lines of tramway on the south side are to be constructed, attempted description of which would only embarrass the reader.

On the north side of the Thames, important concessions have been gained by the companies which are now empowered to lay lines to Leytonstone on the north-east, and to the Minories on the west. This is a great point gained. And, again, a tramway system has been authorized from Highgate Archway to the Bank, with a loop at Holloway to the Angel, by Liverpool Road. Communication will

also be opened on the line between the Seven Sisters' Road and Euston Road. There will be also a tramway between the Kentish Town Railway Station, by College Street and Church Road, to King's Cross.

The ramifications of the tramway system, as authorized up to the last session, are sufficiently extensive to test thoroughly the efficiency of the system. One other system of locomotion, worthy of attention, is the *Thames Subway*.

It has been supposed, from time to time, that the opening o metropolitan railways would relieve the traffic of the streets; this, however, is not found to be the case. In 1850, 13,000 vehicles passed over London Bridge; in 1860 the number had risen to 16,000, an increase of 3000 in ten years. In September, 1860, the Brighton Railway Company was extended to Pimlico; in 1864, the South Eastern Company opened the Charing Cross Station; in the same year the London, Chatham and Dover Company opened their station at Ludgate Hill; and, yet again, in the same year, Southwark Bridge was opened free of toll. It might have been supposed that these circumstances would have affected materially the traffic on London Bridge, but such was not the case. The Brighton company conveyed large numbers of passengers to Pimlico, and the South Eastern to Charing Cross: Southwark Bridge, toll free, gave further relief. Notwithstanding all this, the traffic at London Bridge had risen to 19,400 vehicles a day in 1865, and the only remedy was pronounced to be additional means of crossing the river below bridge.

This brings us to the consideration of a means that has been provided by Mr. Peter W. Barlow, C.E., who has constructed a new Thames tunnel. It is now too late in the day to speak of this as one of the wonders of the world; yet, nevertheless, although apparently a small engineering feat, it is an important achievement, contributing largely to public convenience. Brunel's Thames Tunnel, at Wapping, was, perhaps, a greater engineering work; but the *petit* scheme of Mr. Barlow has proved very much more useful and successful. These two engineering works are in strong contrast the one with the other. Yet another may be referred to, Mr. Rammell's pneumatic scheme for crossing the Thames between Waterloo and Whitehall. The bill for the construction of this pneumatic line was obtained in 1865. Mr. Rammell's system has been in successful operation for several years for parcel conveyance. His principle for passenger traffic is to make the carriage constitute the piston, and the passengers are blown through in one direction, and sucked through in another. It is a somewhat melancholy conclusion that this ingenious scheme is abandoned. The river was dredged for the reception of the tubes, which were partly constructed at Messrs. Samuda's works, at Millwall. The posts, it may have been observed, connected with the works, on the upper side of Charing Cross Bridge, have been removed, and with the opening of the Waterloo Junction Station this pneumatic scheme came to an end.

The traffic north and south of the Thames has always caused great difficulty, as before stated, and the only remedies that can be devised are additional means of crossing the river, especially below London

Bridge. In 1864 there were two schemes proposed for high-level bridges below the Tower. Since then Mr. Barlow has proposed and actually executed his subaqueous passage under our great water highway, to which we now direct attention.

Brunel's tunnel was grand, costly, and—unprofitable. The brickwork carried under the Thames was 38 ft. wide by 22½ ft. high, and was within 3 or 4 ft., at some points, of the bed of the river. It was driven by a shield weighing about 120 tons, and accommodating 36 workmen. The new tunnel is in strong contrast with the other. Instead of being 5 ft. it is 25 ft. below the bed of the river; the subway shield was 2½, as against 120 tons' weight, and accommodated three men. The passage is accomplished by a tubular displacement of about eight feet in diameter, and is, for its entire course, through the impermeable London clay. Eighteen years elapsed between the commencement and completion of the Thames Tunnel, but a year sufficed for the works of the Thames Subway. The one cost 600,000*l*., the other has not cost more than 20,000*l*. The descending shafts to the old tunnel were 84 ft. deep and 50 ft. diameter; the shafts of the Subway are less than 60 ft. deep and 10 ft. in diameter.

A few dates, other dimensions, and characteristics relative to this curious engineering work are worth recording. The works were commenced February 16th, 1869, by breaking ground for the shaft on Tower Hill; in February 1870, numerous visitors were conveyed from one shaft-head to the other. The Tower Hill shaft is 58 ft. deep, and that on the Surrey side 52 ft.; they are each, as stated, about 10 ft. diameter, and are lined partly with cast-iron cylindrical rings, and partly by brickwork in cement. The shafts are covered by iron houses, about 10 ft. square, with projecting pavilion roofs. The "lifts," or hoists, in which the passengers descend and ascend, are iron chambers of about 7 ft. cube, fitted with cushioned seats and stuffed backs, that accommodate 8 or 10 persons. The lifts are counterpoised by balance weights, to which they are attached by a chain passing over a pulley at the top of the shaft; an endless connection is formed by a wire rope, fixed to the bottom of the lift, for working the descent. The lifts work by rollers upon guide rods fastened up the sides of the shafts. They are also furnished with safety clips on their roofs which, in the event of accident, would be released, and grip the guide rods, and arrest the descent within a few feet. There is a waiting-room at the bottom of each shaft, 35 ft. by 10 ft., seated along the sides; one end of the room communicates with the lift; the other on the same level, with the floor of the omnibus which plies through the Subway. At the bottom of each shaft, and under the level of the waiting-room floors, there are recessed pits, in which the small stationary engines and their vertical boilers are fixed, that work the lifts and haul the omnibus. The smoke is carried up the shafts in chimneys covered in by non-conducting packing. The Subway is about 1340 ft. long, and 7 ft. extreme internal diameter; it is lined with iron rings, cast in four segments, 18 in. wide, and ⅞ in. thick. The segments and complete rings are fixed together with ¾-in. bolts, through 2-in. flanges; the joints are caulked with oakum, and pointed with Medina cement. The dryness of the

Subway is one of its remarkable features. The omnibus runs upon a railway of 2 ft. 6 in. gauge; the way has descending gradients of 1 in 30 from each end to the centre, where there is a short length level. The wheels of the vehicle, which is of iron, are 16 in. diameter; each end of it is a duplicate of the other; it has accordingly a door and a conductor's stand-board at each end, and a powerful brake worked by the foot. The lifts, waiting-rooms, and omnibus, are lighted by lamps burning colza oil. The temperature of the Subway is certainly rather high, but it has only to be borne with for a brief space.

The Tower Subway involved entirely new applications of mechanical power in letting down and taking up the passengers, as well as in their haulage, and the shafts and Subway had been completed for some time before the communication could be got into good working order. At first the rope drawing the omnibus was coiled on a cylinder, but serious disadvantages in working were found to attend this plan. Now the omnibus is worked by an endless wire rope, and the service may be said to be complete. On occasions there have been as many as 600 passengers carried from one side of the river to the other in a day. The time occupied in the transit, as we found on a recent occasion, was about three minutes between immerging at one shaft and emerging from the other. The access to the Tower Subway at each end is very quiet and unobtrusive. The waiting-rooms at the bottom of the shafts are really useless, inasmuch as the passengers proceed at once from the lift to the shuttle-service omnibus, and the most important improvement that could be suggested would be a waiting-room above ground, to protect intending passengers from contact with the *gamins* and rude loafers that so much abound in the neighbourhood of Tower Hill. The passage is somewhat rough, the movements of the omnibus being jerky, especially at starting; but, on the whole, the Tower Subway, as a means of passing from one side of the river to the other, may be pronounced a complete success.

The same company has, during the session of 1870, obtained an Act to construct a subway from Arthur Street, City, to St. George's Church in the Borough. The experience acquired in the construction of the Tower Subway, and in elaborating the mechanical contrivances for working it, will prove of great value in making and working the City and Southwark underground communication, which will be, in many respects, a great improvement on the pioneer line. It will consist of two tubes of 8 ft. 6 in. in diameter, which will afford space for omnibuses with sufficient, if not ample, accommodation and head-room. The new line, like the other, will be through the London clay for the whole of its course. The effect of this communication, in combination with the Tower Subway will no doubt be to relieve greatly the pressure as regards pedestrian and omnibus traffic upon London Bridge.

ROBERT SMILES.

NATIONAL PORTRAIT GALLERY.

An account of the National Portrait Gallery, at an early period of its existence, has already appeared in the pages of the 'Companion to the Almanac' for 1859. Although the collection then comprised only fifty-six portraits (fifteen presented, and the rest acquired by purchase), they were sufficiently varied and representative in themselves to afford an idea of what the general result was likely to be. Narrow prejudice, party spirit, and exclusiveness, were, as far as possible, set aside. A collection of this nature will always be most interesting in proportion to the knowledge which the visitors themselves bring to bear upon it.

It would be impossible to limit acquisitions entirely to stars of the first magnitude. They are in themselves comparatively few, and even secondary lights are many of them rare in the extreme. But there are numerous characters in history, in whom we feel a powerful interest, not directly for themselves, but through association with others. These, again, have their limits. A portrait, without any special history attached to it, unless in itself a fine work of art, deserves little attention, and to pass through galleries so constituted is tedious in the extreme. It would be little better than a loss of time. A mere exhibition of personages whom we meet with incidentally in voluminous annals or on the pages of a journal, with little interest beyond that to recommend them, would very soon fatigue. Versailles, perhaps the most extensive collection of mere portraits in the world, is not free from these defects. As a place of study for special reference, like the open pages of a dictionary, it has great value, but many of the portraits are not to be relied on, being either ill chosen or badly executed. The catalogue, however, by M. Soulié, is very instructive and has been admirably compiled. It would have been still better if the persons' names, and the leading dates, had been conspicuously inscribed upon the frames. The circumstance of several of the leading portraits being so unsatisfactory, naturally tends to throw discredit upon the rest, compelling those who really would study the subject to specially investigate each separate picture. In a collection of this nature the portraits offered to view ought to be so thoroughly well authenticated, that the very fact of their being exhibited should suffice as a guarantee.

If any uncertainty had lingered in the mind of the public as to the aim and ultimate effect of the establishment inaugurated in Great George Street, it would have been dispelled by the noble and comprehensive, but far from exhaustive, collection proposed by the late Lord Derby, and so well carried out through three successive exhibitions at South Kensington. They were exclusively composed of protraits, borrowed from every available source. During the three summers of 1866, '67, and '68, no fewer than 2846 portraits were publicly exhibited. With few exceptions, records of all were taken by means of photography. Being exclusively a loan collection, some of the contributions could not escape capricious conditions, such as, that an owner would not consent to exhibit one of his pictures without the rest,

however inferior they might be, being also seen; but the managing powers always possessed the reserve of assigning better or worse places to them on the walls. In some few instances it was reported that possessors of valuable portraits declined to part with them even for a few months, but in such cases the owners generally had no option whatever. Where pictures, as at Woburn Abbey, were strictly entailed, there was no possibility of their removal from the mansion to which they belonged. At Chatsworth and Wentworth Wood House the pictures are deeply imbedded in panels, or built into the apartments which they occupy. A system like this, in the event of an accidental fire, is always a very dangerous one. Beyond even these circumstantial difficulties in parting with pictures, either for a time or in perpetuity, there seems in this country to be an inherent attachment for and unwillingness to part with portraits, not only of family interest, but of generally historical characters. An Englishman's preference for a matter-of-fact portrait over a classical imaginary composition appears to be very decided. Perhaps our natural love of *fact* produces it. We feel a calm gratification in knowing that we may dwell with implicit belief upon the resemblance brought before us. In the multiplicity of portraits professing to represent the same characters during Lord Derby's exhibition, there were such diversities of feature, colour of hair and eyes, figure, costume and dates, as to render it quite certain that the various painters could not have had the same person before them. In some cases, out of so many as five widely differing portraits, it remained to be decided which *one* was to be relied on. Booksellers, even in comparatively recent times, have published very beautiful engravings, to illustrate very meritorious and standard biographies, from pictures that had been imposed on them or selected without sufficient care. In many cases of this nature, the original pictures were exhibited in Lord Derby's collection, thereby enabling the public to examine and judge for themselves.

In the year 1857 Mr. Albert Way collected, for exhibition at the Archæological Institute in London, all the obtainable portraits of Mary Queen of Scots; but such was their discordance and inconsistency that several persons are said to have declared that they had come very undetermined as to what Mary really was like, and gone away more uncertain than ever. Nevertheless, with a little care and patient investigation of facts, the truly reliable portraits may be distinguished from the rest, and they will be found to be more numerous than would at first be expected. One of the serious difficulties to contend with in the pursuit of portraiture is the natural result of persons desiring to possess the representation of some special ancestor or favourite. "Wherever there is a demand there is sure to be a supply," is a maxim only too frequently verified in such cases. The history of fabrications of ancestors and celebrities, in former times very clumsy ones, but now-a-days only too clever, would form a curious chapter. Connoisseurs and picture-buyers of the early part of the last century did not start with anything like the knowledge and investigating powers possessed by the smallest dealer of the present market. Foote, in his admirable and almost forgotten comedy called 'Taste,' draws a vivid picture of

the would-be connoisseurs, and of the nature of the fabrications imposed upon them. The taste for the "dark masters," with boldly massed shadows and powerful effects, had long prevailed, to the exclusion of the more refined and careful portraits of an earlier period. Spagnoletto and Salvator Rosa, the offspring of the School of the Carracci, (amusingly perverted into "Scratchy" by the novelist), were the paintings more especially sought after. Carlo Maratti and Closterman painted portraits in their style. Even old Pepys, the gossiping diarist, put himself to bodily inconvenience to secure pictorial effect. He relates, when sitting for his picture to Hayls, that he nearly broke his neck by continually looking over his shoulder, "and all to have fine shadows." A characteristic attachment in the case of portraiture is displayed with masterly skill by Sheridan, in that scene of the 'School for Scandal,' where the ancestral pictures are put up for sale, when Charles Surface, after ruthlessly selling all the other members of his family, by refusing to part with his uncle's portrait, for whom he retained a sincere attachment, unconsciously regains the favour of the original. Mischievous as the practices of the professional dealers may have been, a great deal more harm was done by persons of position who knew a little and were ready to impose on themselves. Some few individuals, like Horace Walpole, were allowed to influence others and to assume the authority of an oracle. Few persons, unwittingly it may be, have done so much in the last century to mystify or pervert facts as Horace Walpole. Many of the names in his vast catalogue of historical representations are imaginary. Notwithstanding all his shrewdness, industry, and extensive attainment of superficial learning, he succeeded in deceiving himself even more grossly than he misled others. In judging of a man, however, it is needful at the same time to take into consideration the standard of opinion as then existing. Portraits of historical persons and the distinctive peculiarities of costume pertaining to each period were little studied and never properly understood. In those times examples were difficult of access, and without the assemblage of a certain number for purposes of comparison, no satisfactory conclusion could be attained. Walpole readily believed in the great names that accompanied the pictures when offered to him, and, in not a few instances, "the wish being father to the thought," supplied deficiencies, whenever they occurred, as best suited his purpose.

Vertue, the industrious engraver, contributed largely to disseminate an acquaintance with portraiture. Scarcely any history or essay was published in his day without a portrait of the subject or the author being placed opposite to the title page. The exercise of physiognomy is unconsciously planted in us, and the appearance of the writer at the beginning of his own book may more or less tend to prepossess the reader either as to his veracity or the quality of his wit. The study of physiognomy is, indeed, an indispensable qualification for the enjoyment of portraiture. The engravings thus published by Vertue, having mostly the locality or possessor of the original picture recorded on them, tended materially to increase the value of the painting from which the print had been taken. Walpole, in his letters, mentions some curious instances of the increase of price, even

for mere engravings, that had taken place in his day. When the collection of pictures belonging to Vertue's great patron the "collector" Earl of Oxford, was sold in 1742, very few of the finest portraits realised more than 5*l*. The average was about 1*l*. 10*s*. Lord Chesterfield purchased at this sale many of these pictures to decorate the library at Chesterfield House, then in progress of building, and they have only recently been removed from London to Bretby. The following are some of his purchases, with the prices paid:—N. Rowe, 1*l*. 5*s*.; Spenser, the engraved portrait, 2*l*. 6*s*.; Shakespeare, 2*l*. 2*s*.; Cowley, 3*l*. 15*s*.; Swift, 10*l*. 10*s*.; Denham, an oval, 4*l*. 10*s*., and the Earl of Dorset, 11*l*. The magnificent family picture, by Van Dyck, of Sir Kenelm Digby, his lady and children, offered at this sale, was bought in at the value of 173*l*. 5*s*. It is still in the possession of Lord Oxford's descendants, and belongs to the Duke of Portland, to whom it passed by marriage.

At the celebrated sale of Sir Luke Schaub's pictures, in April, 1758, the reputed Correggio, representing Sigismunda, fetched 404*l*., which aroused the indignation of Hogarth, and provoked him to attempt to surpass it. The result, when viewed at the present interval of time, is a failure. At the same sale a fine head of Philip de Champagne, by himself, brought only 4*l*. 12*s*. 6*d*. The Duchess of Portsmouth, by Lely, 4*l*. 7*s*. 6*d*. The uncertainty of prices obtained at sales is a matter too well known to require explanation; but in sales like the preceding, the town had been occupied in looking forward to them, and they became leading topics of the day. Even so late as July, 1850, when some of Lord Bessborough's very fine portraits were sold, many of the prices contrast strangely with those attained in more recent times. The following may suffice for example:—Sir R. Steele, a very fine head, by Kneller, 3*l*. 18*s*.; Sir Christopher Wren, holding a pair of compasses, the well-known picture by Kneller, now in the National Portrait Gallery, 21 guineas. Ben Jonson, 8½ guineas; Congreve, now in the National Portrait Gallery, 4½ guineas; Pope, 13½ guineas; Swift, painted by Jervas, similar to the one bought by Lord Chesterfield, 8½ guineas.

When the collection of pictures in the newly established Portrait Gallery amounted to fifty-six, the trustees determined, so far as possible, to afford the public an opportunity of seeing what progress had been made. They accordingly appointed two days in the week, Wednesday and Saturday, for the admission of visitors by tickets, which were easily procurable at Colnaghi and Graves', the print-sellers in Pall Mall, and at Smith's, the picture dealer in Bond Street. The hours of admission from 12 A.M. to 4 P.M. The first public day was Saturday, the 15th of January, 1859. Catalogues were sold in the rooms at 1*s*. each.

During the Easter holidays of 1860, the restriction of procuring tickets was suspended, and the public entered freely during the first three days of the week. A considerable number of visitors came, and a large proportion of these belonged to the working classes. The interest which they showed in the pictures before them was very

encouraging. From the beginning, inscribed tablets, giving the names of persons and leading dates, had been attached to each picture. The narrow limits of the rooms assigned to the collection were now beginning to be seriously felt, but the trustees continued guardedly and steadily to increase the facilities of admission to the gallery. Their third annual report to the Treasury concluded in the following words:—"It need scarcely be added that the admission of the public on the largest scale, and without restriction of any kind, will be a paramount object with the trustees whenever their temporary apartments can be exchanged for a permanent and commodious gallery. This is a point which they would venture to press on the serious consideration of both the government and the legislature." For nine succeeding years the trustees repeated the same appeal. In the month of April, 1864, during the celebration of the Shakespearean tercentenary, the gallery was open without restriction during a whole week, so as to afford the public an opportunity of seeing the Chandos portrait of Shakespeare. During Whitsuntide of this year the gallery was open on three successive days, as at Easter. The number of visitors on the Monday amounted to 453 more even than had attended on the corresponding day of Easter week. The trustees, observing the steadily increasing number of visitors, directed that the doors should be opened on public days at ten instead of 12 o'clock. It was not, however, till June, 1865, that a third public day was established. Since that time the gallery has always been open on Monday. In consequence of the extreme order and quiet invariably maintained by all seeking admission, the use of tickets had been gradually relaxed, and after the 14th of March, 1861, was entirely dispensed with. Printed lists, giving the names both of the artists and of persons represented, with leading facts, and the dates of birth and death, were gratuitously distributed among the holiday visitors at Christmas, Easter, and Whitsuntide. This system, with very satisfactory result, has ever since been maintained on all holiday occasions. The writing on the frames supplies ready information whilst looking at the picture; but the printed list enables the visitors to remember what they have seen, and frequently encourages them to repeat their visits. On several occasions the holiday folks were observed to bring with them the list which they had received before.

In the rules laid down by the trustees for their own guidance, and in all public announcements pertaining to the institution of the gallery, no definite specification was offered as to the style, nature, or size of the portraits to be collected.

The first 27 acquisitions consisted exclusively of portraits in oil; the 28th was a fine little crayon drawing, by Lawrence, of Mrs. E. Carter. The perishable nature of the material raised some doubts as to how far such a work of art could be safely exposed for general exhibition; but it was finally accepted.

The first miniature was offered November, 1858, and represented 'Athenian Stuart.'

The portraits of the sculptors Nollekens (30) and Chantrey (85) preceded any actual example of sculpture in the gallery. They were soon, however, followed by a medallion, in bold relief, of Kirk

White (92), modelled by Chantrey. It was offered as a gift, February, 1860, by Dr. F. Boott, principally to test how far sculpture would be regarded as a means of affording portraiture.

A portrait of Flaxman (100), was next given; and in March, 1861, the first marble bust, that of Pitt, by Nollekens (119), was received. At the same meeting was obtained a fine terra-cotta bust of Hogarth, by Roubiliac (120), very difficult, owing to the tender nature of the material, to protect from accidental injury.

'The Duke of Kent,' a wax medallion (206), of a still more precarious nature, owing both to the liability to melt in warmth and to crack and peel off from the ground in cold weather, was accepted February, 1866.

The first example of bronze, John Kemble, by Gibson (148), was presented July, 1862.

Medallions of metal, which in themselves effectively, and with great delicacy, delineate character, have hitherto only been introduced as illustrating other portraits. The first illustrative medallions were Primavera's 'Mary Queen of Scots' and Bowyer's 'Medal of the Seven Bishops,' presented respectively by Messrs. Albert Way and Ashton Bostock.

A beautiful enamel of 'Sir T. Winnington' affords a satisfactory example of a durable form of art, and is of great artistic value.

Several busts and models in plaster of Paris, that had been offered to the Gallery, were declined, on account of the very perishable nature of the material. The difficulty, however, was obviated by the suggestion, when a fine original model had been offered of a bust of 'Dean Buckland,' March, 1868, that the plaster of Paris might safely be converted into, or replaced by, bronzed copper through Messrs. Elkington's electrotyping process. The sculptor and donor having consented, the experiment was made with complete success, and the bust of the Dean of Westminster now appears in the Gallery to all intents and purposes a piece of solid bronze. The same process has subsequently been adopted, with equal success, in reproducing other historical monuments belonging to Westminster Abbey.

At the time when the effigies of Henry VII. and his queen, Elizabeth of York, were undergoing a careful inspection, and being thoroughly cleaned, it was thought to be a favourable opportunity to have casts taken from them. Mr. Brucciani was employed to mould them, and the electrotypes taken from these may fairly be regarded as the most perfect reproductions of the originals that could possibly be obtained.

The original number of the trustees appointed by the Board of Treasury was thirteen. To these, in 1859, were added the Bishop of Oxford, now of Winchester, Mr. William Stirling, of Keir, now Sir William Stirling Maxwell, and Sir George Cornewall Lewis. On the decease of Lord Macaulay, at the close of the same year, his place at the Board was filled by Mr. William E. Gladstone. In 1860, Earl Somers was appointed a trustee. On the death of Sir Francis Palgrave in the following year, Lord Stanley, now Earl of Derby, succeeded him. The vacancy caused by the decease of Lord Herbert had not been filled up. The number of trustees, therefore, at that

time amounting to sixteen, was again reduced by the demise of Lord Lansdowne in January, and Sir George Lewis in April, 1863. In the May following the Earl of Dudley was added to the Board. In February, 1866, Sir Francis Grant succeeded Sir Charles Eastlake as President of the Royal Academy, and also to a seat at this Board. The Dean of Westminster was also appointed one of the number. Mr. W. H. Carpenter of the British Museum died, and, under the operation of a bylaw, Lord Dudley and Lord Elcho withdrew.

In September of the same year, Mr. A. B. Beresford Hope and Sir Coutts Lindsay were appointed to the vacant seats. On the secession of the Marquis of Salisbury and Mr. Carlyle, Earl Cowper and Viscount Hardinge, by a Treasury minute dated March, 1869, became trustees. Since that date no change has taken place. The number is fifteen, and the Board constituted as follows:

The Earl Stanhope, P.S.A., Chairman, William Smith, Esq., F.S.A., Deputy Chairman. The Lord President (for the time being), the Earl of Derby, the Earl Cowper, K.G., the Earl Somers, the Viscount Hardinge, the Lord Bishop of Winchester, the Right Hon. W. Ewart Gladstone, M.P., the Right Hon. B. Disraeli, M.P., Sir William Stirling Maxwell, Bart., Sir Coutts Lindsay, Bart., the Very Rev. the Dean of Westminster, Sir Francis Grant, P.R.A., and Alexander Beresford Hope, M.P.

The deliberations of the trustees on art questions are well supported by the great practical knowledge and unrivalled experience in portrait matters of the Deputy Chairman, by the President of the Royal Academy, and by the distinguished amateurs whose paintings and technical mastery are so well known, Lord Somers, Lord Hardinge, and Sir Coutts Lindsay. Sir William Maxwell is no less eminent as a collector, and known, through his publications, with profuse illustrations, as a benefactor to the literature of art.

At the close of the year 1869, when the Government had finally decided upon the removal of the collection to Kensington, pending the construction of a permanent building in connection with the National Gallery, Trafalgar Square, the number of portraits amounted to 288. Up to this time, by dint of contrivance with screens, and resting many of the best pictures directly on the floor, so as to hide the dado and skirting-board, these pictures and busts, with many of the frames overlapping one another, were crowded together for public view in three small dark rooms, and in the passages and gloomy walls of a narrow staircase, in Great George Street, Westminster.

The space temporarily assigned to the Gallery at South Kensington extends over one-half of the southern arcades bounding the Horticultural Gardens, and opening from Exhibition Road. This spacious gallery, on the upper floor, was occupied by the National Portrait Exhibition of 1866, and the capabilities of the building were well manifested during the two succeeding years. The space now made available to the trustees for public exhibition consisted merely of this eastern half, and as before, in order to gain space, screens at right angles with the length of the gallery had to be constructed. Here, however, an important change was made in the new disposition of the screens from that adopted during the three exhibitions under

Lord Derby's auspices. In order to secure as much light as possible they were made to spring directly from the windows, and the line of passage was confined to the side of wall opposite to the windows. The light upon the pictures attached to these screens is consequently stronger and far better.

The uncertain strength of the floor precluded the arrangement of heavy marble busts and pedestals round the screens and in good light near the windows. They were consequently ranged on solid shelves and brackets, securely built into the back wall, strengthened at intervals by pilasters.

The days of admission in the new Gallery remain as before, excepting the substitution of Tuesday for Wednesday. These correspond with the public days of the Kensington Museum in the immediate neighbourhood. No money is received at the Portrait Gallery for admission, but the trustees have made arrangements by which visitors who have paid the customary fee to see the Kensington Museum and Fine Art Galleries, should also, without any additional charge, be permitted to walk through the Portrait Gallery.

The total number of portraits, whether in painting, medallions or sculpture, amounts, in September 1870, to 315.

They may be broadly classified under fourteen different heads, and the following list indicates the relative proportions. No picture has been counted a second time, although many of the individuals claim recognition in various capacities. Statesmen and diplomatists, 53; literary characters, poets, and historians, 51; royalties, 41; clergy of all denominations, 34; scientific, including medical, engineers, travellers, philosophers, and philanthropists, 32; artists, including painters, sculptors, and architects, 31; military heroes, 19; nobility, 15; lawyers, 11; naval heroes, 9; ladies, 8; actors and actresses, 7; scholars, 2; musicians, 2.

We now propose to review the most important of the portraits that have been acquired since the publication of our last notice, classifying them according to stations in life, and appending after each name the date, in brackets, when the portrait was obtained.

Our former list of 1858 did not include the name of any one reigning sovereign. Such portraits could be easily seen in the public galleries of the British Museum, at Hampton Court, at Windsor Castle, and in the municipal buildings of almost every country town. The earliest known English contemporary portrait of an English sovereign was that of Edward III., in St. Stephen's Chapel; but this, unfortunately, perished in the great fire which destroyed the Houses of Parliament in 1834. Next to this, in importance and period, were two portraits of his successor, Richard II.: one, similar in minuteness and richness of costume, formerly in the royal collection and now preserved at Wilton House, the other in the Jerusalem Chamber at Westminster. Both of them are, happily, in good preservation. The Westminster picture became, in the year 1866, the subject of a very interesting restoration. The picture was twice seen at the Kensington portrait exhibitions; first of all with an accumulation of successive restorer's paint on it, and finally after it had been restored as near as possible to its pristine condition.

The first royal portrait purchased by the trustees was James I., as the boy-king of Scotland, full length, holding a falcon on his wrist. (1859), a similar picture is in the collection at Hardwick, and another is described as once among Charles I.'s pictures, but no longer in the royal collection. The style and date, 1574, on it, led to the supposition that the picture was painted by Federigo Zucchero, who passed into England that same year from Flanders, after having been in the service of the Cardinal of Lorraine, uncle to the young king's mother, Mary, Queen of Scots. Another and very appropriate portrait of the same monarch, dated 1621, seated in royal robes and at full length, was acquired still later (1860). His motto, "Beati Pacifici," and the empty scabbard hanging at his side, for he never could bear to be drawn with a sword, afford an epitome of his character. Queen Elizabeth (1860) first appeared in a delicate miniature by Hilliard. The queen was then 38, and the face is extremely pleasing. It was at this period that she was coquetting with the Duke of Anjou, before the terrible Massacre of St. Bartholomew. The miniature is painted on the back of an ordinary playing-card, the reverse still retaining the no doubt carefully selected picture-device of the queen of hearts. Another portrait of her (1865), an oil-painting, representing her at about the same age, affords an elaborate display of jewelry. Enormously large and curiously cut diamonds, with a richly enamelled device of a phœnix, her favourite device, attached to a ponderous collar or chain, are depicted with singular precision. She holds a rose in her hand, and the picture is well known through an engraving published by Mr. Bentley.

A third portrait (1865) was presented in the same year by the Mines Royal Company. It exhibits her, like one at Hampton Court, at a very advanced period of life. The painter certainly does not seem to have ventured upon, or even to have been capable of, flattery. It is, however, remarkable that in none of these portraits of Queen Elizabeth does the large circular ruff make its appearance. That article of costume really belongs to a very late period of the sixteenth century. Even in France, where it was at first more distinctive of men than women, it can scarcely be traced in royal costume earlier than 1579. Nevertheless, we are so generally familiar with it, that the ruff has become accepted as the distinctive feature of the virgin queen; and nearly every portrait, English or foreign, thus decorated is generally christened with her name. An illustration of this costume is seen in the portrait of the Queen of Bohemia (1859), daughter of James I. Her name also was Elizabeth, and many of her portraits in great nouses, under the influence of imperfect tradition, whilst retaining the Christian name, are attributed to the great queen who defeated the Spanish Armada.

The earliest monarch whose portrait has as yet been obtained for the gallery, is Henry IV. (1870). The picture is similar to one now at Windsor. It can only be traced back among records of the royal pictures at Kensington Palace to the time when Vertue engraved a "similar" picture to it at Hampton Court, in Herefordshire, about 1732. The type of this picture, however, was engraved as Henry IV. in the Baziliwlogia, the first set of English monarchs ever published,

as early as 1618. The same was also engraved by Hollar. Richard III., presented by Mr. J. Gibson Craig (1862), is an early repetition of the very striking portrait at Windsor Castle, and which since the time of Henry VIII. has never been alienated from the royal collection. He plays with a ring on one of his fingers, and his countenance wears an expression of cunning blended with malice. His hair is cut short and square, in accordance with the fashion of the time. His face is smooth, and he wears a plain black cap on his head, without any distinctive insignia of royalty. Many repetitions of this picture, but of very inferior quality, are to be met with in various great houses of our nobility.

Henry VII., his conqueror on Bosworth Field, appears (1869) in the electrotype from Torrigiano's fine effigy on the monument in Westminster Abbey.

Torrigiano was one of the few great Italian artists whom Henry VIII. succeeded in inducing to come over to this country. The original bronze, in the Abbey, being placed on a lofty pedestal and surrounded by an elaborately wrought screen of bronze, is very difficult of access, whilst in the copy now at Kensington every part of the surface may be minutely studied.

Queen Elizabeth of York, the consort of Henry VII., from the same monument (1869), is also a finely modelled statue; in both these effigies the masterly execution of the hands, joined in the act of prayer, deserves particular attention. A coloured portrait of the same queen, very recently acquired (1870), possesses small value beyond serving to afford particulars in which the nature of the bronze must be deficient. Similar pictures are at Windsor and in the chapter-house of Christchurch, Oxford. The head-dress which she wears is of the same form as that which has been traditionally handed down to our day in the figures of the queens on our ordinary playing-cards.

The portrait of King Henry VIII. painted on copper (1863), represents him at an earlier period of life than we are generally accustomed to see. The countenance bears out the tradition that he was exceedingly handsome when young. This picture came from Lee Priory, and resembles a very fine one at Althorp, in the possession of Lord Spencer. In the magnificent cartoon by Holbein, representing the king and his father, full length, for the Privy Chamber at Whitehall Palace, the head is turned in the same direction. A photograph from this cartoon has been presented to the Gallery by the present owner, the Duke of Devonshire.

Catherine of Arragon, a remarkable portrait, also from Lee Priory (1863), exhibits a countenance very like her father's, Ferdinand the Catholic, with round face, short nose, and very thick lips. Her sister, the famous Jeanne la Folle, had the same peculiarities. The face differs widely from the popular notion of this queen's personal appearance derived from a picture which was at Strawberry Hill, and engraved in 1743 by Houbraken.

Walpole, however, admits of his own picture that it most probably represented Catherine Duchess of Bar. Our stage representations, especially by Mrs. Siddons, of Shakespeare's heroine, have still further tended to strengthen the popular impression. Here, in the Gallery,

we look in vain for any indication of personal dignity or power of mind. Similar portraits are still at Windsor, and among the miniatures of the Duke of Buccleuch. This latter formerly belonged to King Charles I.

There are as yet no portraits of any of the succeeding Queens of Henry VIII., nor of Edward VI. or Queen Mary in the gallery.

Mary Queen of Scots appears in a very singular picture known as the Fraser Tytler portrait (1860), from having been formerly in his possession, and constituting the subject of an elaborate disquisition from his pen. It is a half-length, life-size, and represents her during the one year 1560 that she was Queen of France. An escutcheon, with the arms of France and Scotland quarterly, hanging from the branch of a tree, could only pertain to this period. The elaborate ornaments of her dress combine royal insignia with devices peculiar to her husband, François II. The picture is evidently the work of a French painter; every minute detail of the jewelry is wrought with amazing truthfulness, and could only have been drawn from reality. The countenance, allowing for the influence of time, accords with the effigy on her monument in Westminster Abbey, and with a contemporary medallion executed by Jacopo Primavera. A rare engraving of Mary, when dauphine, just before her husband's succession to the throne, issued by Merecinus, conveys all the peculiarities of this youthful physiognomy. In the latter she holds a feather fan, and the fingers of her hands have precisely the same lengthiness and stiffness observable in this picture. They indicate great tallness of stature, which both she and her mother, Mary of Guise, were remarkable for. The only difficulty to placing implicit reliance in the picture is that in all the absolutely authentic portraits of Mary Queen of Scots the eyes are deep-brown with a bluish tinge in the whites, whilst here the eyeballs are of a decided blue. The handsome lace ruff which she wears is about the earliest instance of this article of dress being worn so high and in such amplitude. A very fine cast, taken from the monument in Westminster Abbey, has been presented to the Gallery (1870) by Mr. John Hosack, the chivalrous and most recent defender of Mary's personal character. As in the previous instances, the trustees have taken measures to convert the perishable plaster of Paris into durable bronze.

Anne of Denmark, the dull and extravagant Queen of James I. (1861), is sufficiently represented in a poor and not very delicate picture by Van Somer. There is a hard and unsympathising expression in her face. Among the jewelled devices on her standing collar and in her hair, may be observed the figure 4 enclosed within the letter C. This refers to her very favourite brother, King Christian IV., who paid several visits to England, and mainly distinguished himself by "potations deep." No doubt Shakespeare's passages in 'Hamlet,' alluding to the Danish king's intemperance, were readily interpreted by the audience.

Her daughter Elizabeth, Queen of Bohemia, the 'Queen of Hearts,' (1859) bore a strong resemblance to her brother King Charles I., having the same tinge of melancholy when in repose, but, as might be expected, with more fire and fixed determination in the eye. The

portrait was painted abroad by Mireveldt, and exhibits far more delicacy and refinement than could be attributed to Mytens, who wrought in England at the same period. Charles I., notwithstanding that there are so many fine portraits of him by Mytens, Van Dyck, Dobson, Stone, and Lely, in various collections, is only represented by a bronze bust of a well-known type, modelled by Fanelli (1870). Although comparatively coarse and mannered in execution, it portrays the leading peculiarities of the king's head and the growth of his hair more decidedly than in portraits where these points are more or less subdued by colours or reduced by shade.

Henrietta Maria (1867), his determined, but beautiful and intriguing wife, appears standing with hands joined, wearing an amber-satin gown with black bows. It is a refined and well-preserved picture, similar to one at Warwick Castle, and has, in all probability, been touched upon by Van Dyck himself. The tone of the shadows is less mellow and more purple than usually seen in the works of this master, but the picture is evidently the production of an experienced and delicate hand. It had at an earlier period made its way over to Quebec, whence it was obtained for this Gallery.

The five children of Charles I., with Prince Charles in the centre resting his hand on an enormous dog (1868), is an excellent contemporary copy, formerly in Paris, from the famous picture by Van Dyck, in the Van Dyck Gallery at Windsor Castle. These portraits were painted in 1637. The girl to the left, who married the Prince of Orange and became mother of our William III., has the sharp decided look of the Queen of Bohemia, rather than the quick glance of her own mother, Henrietta Maria.

James, Duke of York, is dressed like a girl, in long petticoats, but the countenance of Charles, even at that early age, appears fully imbued with the saturnine tendency and all the peculiarities of his after period. That the boy may be said to be the "father of the man" is manifestly shown by comparing this figure with the other portraits of him in the Gallery.

Charles II. (1863), painted by Mrs. Beale, within an oval stone-coloured framework, so characteristic of the period, exhibits the monarch with a sallow worn face under a heavy black wig, and looking the very reverse of a "merry monarch," the title so frequently applied to him.

Henrietta, the younger sister of Charles II., not born till 1644, seven years after Van Dyck had completed the family group above mentioned, is poorly represented in a half-length portrait (1867), attributed to Mignard. She became Duchess of Orleans, sister-in-law to the *Grand Monarque*, and, after a visit to England on some special mission, died somewhat suddenly, not without suspicion of poison, in 1670.

James II. in after life is not yet represented, but his son, 'The Old Chevalier de St. George' (1868), is seen in a very delicate miniature, painted in oil upon silver, by Delle Belle. 'Mary of Modena,' the Pretender's mother (1866), whose portraits are very far from common, is painted by Wissing, and of this type there exist several repetitions in houses of the nobility. William III. appears only as a child at

the age of seven years (1868), but in a long dress and decorated with the Order of the Garter. The picture is an interesting example of Cornelius Jonson Van Ceulen at the later period of his career. There are various repetitions of this picture; one very fine one, belonging to Earl Howe, was exhibited in the 1867 Portrait Exhibition.

The two daughters of James II., painted by Wissing and Dahl, are very indicative of their respective characters. Mary (1865), seated in ermined robes in the gardens of a palace with the crown beside her, the colours rich and deep in tone, and a placid expression of countenance. Anne (1866), on the contrary, a vulgar figure, standing in royal robes, with crown, orb and sceptre, appears irritable and tenacious of her royal prerogatives. The hair and eyes are paler than generally seen in her portraits. Her hair is usually black, and her complexion very ruddy. At this period it is remarkable that head-dresses or jewelled decorations in the hair were seldom worn. The "fontanges" of lace were discarded by the young, and the natural beauty of the hair was seen to the fullest extent when gathered up and thrown back away from the forehead. At this time also it may be observed that rings and bracelets are very rarely to be met with on portraits of ladies of highest rank. The Gallery does not, as yet, include a portrait of Queen Anne's early friend the Duchess of Marlborough.

The mother of these two queens, Anne Hyde, Duchess of York, (1867), although only an oval portrait seen to the waist, and resting her cheek on her hand, is a fine example of the style adopted by Sir P. Lely, and also of the appearance made by ladies of rank and respectability after the Restoration.

A very attractive picture, finely painted, by Wissing, of the unfortunate Duke of Monmouth (1862), an oval, in armour, with rich flowing hair, is an excellent type of the youthful nobility of that period. The face, although fresh and smooth, bears, especially in the look of the dark eyes, considerable resemblance to that of his royal father. The saturnine complexion, but with a more aquiline nose, is dominant in the small portrait, by Hoskins, of Prince Rupert (1867). It bears a much closer resemblance to King Charles than to his mother, the Queen of Bohemia, in whom we have already observed a close resemblance to Charles III. Prince George of Denmark, the sottish consort of Queen Anne, known by his "*Est-il possible?*" is not in the Gallery, but a handsome portrait of him is at Hampton Court. George I. and his queen, Sophia Dorothea of Zelle, are likewise absent. Portraits of the latter are rare in the extreme. She was painted early in life as a flower-girl, by Gascar, and a portrait of her in a straw hat is still preserved in the Castle of Ahlten. Her countenance seems to have very much resembled her husband's. They were first cousins.

George II. also, when young, greatly resembled his father, as may be seen in a well-painted full-length portrait, now in the Gallery (1865), taken probably soon after his accession; contemporary engravings confirm the countenance as here depicted. In later life the nose became curved, the forehead retreated, the lower lip protruded, and the eyes assumed a painful degree of prominence. The portrait by Worlidge (1868), taken in profile, exhibits all these peculiarities. The Culloden

Duke of Cumberland (1867), is a small sketch, perhaps by Powell, for engraving, from the full-length by Sir Joshua Reynolds, in Buckingham Palace, which is repeated also at Chatsworth. King George III. and his Queen (1866) are seen in early life in two half-length state pictures, originally much larger, by Allan Ramsay, the Court painter. The backgrounds are left unfinished, but the figures themselves are carefully wrought and dignified in character. A spirited sketch in profile of George IV. (1861), taken by Lawrence, as a guide for preparing the new coinage, contrasts, both in subject and in manner of execution, with a large, full-faced, fiery picture of his wife, Caroline of Brunswick (1867). The painter could not, even with his utmost carelessness, conceal the technical power which nature had bestowed on him; but in this picture some of his grossest faults, slovenly drawing, glare of tone, and absence of delicacy, are painfully apparent. The Princess of Wales, for such her title then was, is represented attired in a crimson velvet dress with bare arms, seated on a sofa, pausing in the execution of a large bust of George III., her steady friend, which she had been modelling in clay. This art is known to have been one of her favourite accomplishments, and Turnerelli, the sculptor, gave her occasional lessons in it. A second portrait of her daughter, the Princess Charlotte of Wales, a bequest from the Rev. Dr. Bulley (1866), is remarkable, when compared with the present members of the Royal Family, as showing how strongly likenesses can be transmitted and preserved. The father of our Queen, the Duke of Kent (1866), a small wax medallion in profile, was presented by Mr. Edmund Christie, and is a pleasing specimen of a style of art especially fashionable in former days, when daguerreotypes and photographs were utterly unknown.

One of the rules laid down by the trustees of the National Portrait Gallery for their guidance was, that with the exception of the reigning sovereign, and his or her consort, no portrait of a living person should be admitted. To this rule the trustees have stringently adhered.

Her Majesty, it is understood, has graciously consented to contribute her own portrait, as companion to one which she was pleased to bestow upon the collection in memory of the Prince Consort (1867). It exhibits his fine manly figure standing in dark uniform, resting one hand on a sword. The artist, Winterhalter, has cleverly devised, notwithstanding the sombre nature of the costume, to give brilliancy to the picture, by the richly-coloured robes of the Order of the Bath thrown over some furniture, by a bright red curtain, and by a sunny landscape seen beyond a balcony, in the distance.

The portraits of nobility include an interesting bust picture of James, the 7th Earl of Derby, the zealous Royalist, who, after the battle of Worcester, was captured and beheaded at Bolton, in 1651. This picture, one among many repetitions, the finest of which is at Wentworth House, was presented (1860) by the late Earl of Derby. Lord Hervey, a large full-length picture, presented by the late Marquess of Bristol (1863), exhibits the foppish courtier and opponent of Pope, and by his appearance renders intelligible the poet's words, "a mere white curd of asses' milk." The Earl of Charlemont (1864), a small whole-length picture by Livesay, a little-known Irish painter,

contrasts very strikingly in character with the one last named. Robert Devereux, Earl of Essex (1864), the special favourite of Queen Elizabeth, who never recovered her wonted spirits after his execution in 1601, affords a favourable example of the gallant and refined courtier of that period. Although somewhat resembling the notorious favourite of the next reign, George Villiers, Duke of Buckingham, whose portrait is not yet to be seen in the collection, the head is far more intellectual and manly. Henry Jermyn, Earl of St. Alban's (1865), supposed to have been married in later times to Queen Henrietta Maria, is painted by the facile pencil of Lely, with a full fat countenance, partaking of the sensuality which distinguished the court of Charles II. A very singular and almost humourous character strikes one in the small full-length picture of Lord Lovat, seated in a high-backed chair, facing the spectator and counting with his fingers (1866). It is only the wreck of a picture by Hogarth, who also executed a well-known etching from it. A stern and dignified personage of the time of Edward VI., in excellent preservation, is Henry Grey, Duke of Suffolk, K.G., the father of Lady Jane Grey (1867); a duplicate picture, which was engraved in Lodge's Portraits, still belongs to the Marquis of Salisbury, at Hatfield. The Earl of Dorset, patron of Dryden, and himself known by the song of "To all you Ladies now at Land" (1867), is from the pencil of Kneller, at his earliest and most vigorous period. The Earl of Craven, married to Elizabeth, Queen of Bohemia, a fine and effective figure in armour (1868), is an admirable specimen of Honthorst, "Gherardo delle Notti," who was much patronised by the Queen's family, and whose portraits still abound at Coombe Abbey, the residence of the Earls of Craven. The witty and profligate Duke of Buckingham, author of the 'Rehearsal' (1869), and favourite of Charles II., exhibits a grossly sensual face with a profusion of hair, clad in peer's robes. His countenance is an exaggeration of that of the Earl of St. Alban's above mentioned. The Countess of Shrewsbury, whose portrait was purchased together with this, at the sale of the Marquis of Hastings' collection, affords an instance of the breadth of view adopted by the trustees in forming the collection. This abandoned woman, who is said to have, in the dress of a page, held the horse of her husband whilst the duke, her paramour, slew him in a duel, may unhappily be regarded as the type of a numerous class of women holding a high position in those days. Her notoriety cannot be doubted. As a picture, it is one of Sir Peter Lely's most masterly performances.

The hard features of Viscount Cobham (1869), the founder of Stowe, powerfully painted by Van Loo, next come under notice. The picture was formerly in the gallery at Stowe. A very interesting and large full-length portrait of the first Duke of Bedford commands attention at the further end of the gallery. This picture is by Kneller (1870). This fifth Earl and first Duke was, as a young man, painted by Van Dyck in the celebrated picture now at Althorp, and afterwards by Sir Peter Lely in various pictures at Woburn Abbey. He was father of William Lord Russell, and made the pathetic reply, when appealed to for aid by James II., when his friends were deserting him in his misfortunes. The king said, "My lord, you are a

good man, and may do me some service." The duke replied, "Sir, I am old; I had a son, who might have served your majesty, had he lived." He died in the year 1700, aged 87.

The first purchase made by the trustees (1857) was Sir Walter Raleigh, described in the former notice of the collection. One of their most recent (1870) was a valuable portrait of his rival, Thomas Radclyffe, Earl of Essex.

The list of statesmen is longest of all. The first in the series, after that of Mackintosh, noticed in our previous account, is the famous Marquis of Winchester (1859), who held the Lord High Treasurer's wand of office through four successive reigns, from Henry VIII. to Elizabeth. When asked how he contrived to retain his place through so many changes, he replied that his wand was made of the willow and not of the oak. He bent to circumstances.

The Earl of Shaftesbury (1859), a delicate example of the artistic talent of Greenhill, a short-lived and very little-known pupil of Sir Peter Lely. He painted a good portrait of John Locke. A sale of several pictures at Wolterton, belonging to the Walpole family (1859), enabled the trustees to secure a fine original portrait of Sir Robert Walpole, the Earl of Orford, which has been many times repeated, but in no instance, not even in the one at Hampton Court, with equal care and refinement. John Selden, in advanced life (1859), is similar to one in the old Ashmolean collection at Oxford. Warren Hastings (1859), a small bust picture, is by Tilley Kettle, an artist who resided some time in India. It has been engraved in the 'European Museum,' and belonged to Sir Richard Sullivan. Sir Stamford Raffles (1859), Thomas Winnington (1859), an exquisite miniature, presented by Sir Thomas Winnington, his descendant. Sir Lionel Jenkins, the diplomatist (1860), is the work of Tuer, an artist residing at Nimeguen, and presented by the Rev. J. M. Traherne. The famous Earl of Leicester, favourite of Queen Elizabeth, appears at an early period of life (1860). His magnificence is chiefly remembered by his entertainment at Kenilworth, and his superiority as a ruler and hero, shown by his command in the Netherlands, and heading the queen's troops, when the Spanish Armada was expected. Robert Cecil, son of the great Lord Burleigh, whose portrait does not appear, was called by James I. "the little beagle." This picture was presented (1860) by the eminent Scottish antiquary, Mr. David Laing. Sir Dudley Carleton (1860), a fine example of the pencil of Cornelius Janssen, was presented by the late Felix Slade. At this period (1861) a valuable bust of William Pitt, executed in marble by Nollekens, was presented by Earl Granville. This, as observed before, was the first introduction of a marble bust into the gallery. Lord Auckland (1861), a small drawing by Edridge, was presented by Earl Stanhope, chairman of the Board of Trustees. Lord Lyttelton, "the good Lord," presented by his descendant, the present Lord, is by a painter of whom no record is preserved. A fine terra-cotta bust of Oliver Cromwell (1861) has special value as exhibiting a different interpretation of the countenance from that given by the frequently repeated oil paintings and miniatures. The face seems shorter and rounder, with somewhat more ferocity in the expression. The finished marble, made by Pierce,

a sculptor employed by Cromwell, is in the possession of Lady Taunton. A marble bust of Lord George Bentinck (1861) is a posthumous work of Campbell, executed under the immediate direction of Mr. Disraeli, Lord George's biographer. Two other busts in terra-cotta, of C. J. Fox and Charles Hampden, were next added (1862).

Sir William Temple (1862), a fine picture by Sir Peter Lely, is similar to the well-known engraving by Houbraken. The Earl of Chesterfield (1863), painted in middle life, by William Hoare, of Bath, was formerly in the possession of Sir Richard Phillips, the eminent publisher. It holds a position between a younger portrait in the British Museum by the same artist, and a very impressive representation of the great lord in advanced age, by Gainsborough, now in the possession of Earl Stanhope at Chevening.

The marble bust of the Right Hon. George Tierney, sculptured by Behnes, was presented by his son (1864). A small portrait of the late Marquis of Lansdowne, the great patron of art (1864), painted by Hoppner in 1806, would scarcely be recognised by those who knew him at a later period of his life. He knew the picture at Grillon's, and used to relate that he well remembered sitting for the picture. It was then considered very like. The Earl of Sandwich (1864), a bust-portrait by Zoffany, is a part-replica from a large engraved picture at the Trinity House. The Marquis of Dalhousie (1865), Governor-General of India, presented by the brother of the artist, Sir Watson Gordon, recently deceased. This picture was admitted under the operation of the saving clause of a bylaw, which has rarely been called into requisition, namely, that no portrait of any person deceased less than ten years shall be admitted unless three-fourths of the trustees shall vote in its favour. In this instance opinions in favour of the portrait were entirely favourable. William, Lord Russell (1865), a small portrait attributed to Riley, is younger and less full in the face than usual with the rest of his portraits. Daniel O'Connell (1866), a small miniature by Mulrenin, exhibits a mild and soft face, far from indicative of the turbulent spirit which the "Agitator" was known to possess. Richard Cobden (1866), a marble bust by Woolner, presented by Mrs. Cobden. The Right Hon. Henry Pelham (1866), a finely-painted picture by Hoare of Bath, and duplicate of one at Clumber Park, was presented by S. Loyd, Esq. A small circular medallion in bronze of Lord Macaulay, by Marochetti, was purchased at the sale of his collection (1868) for a considerable sum. A delicately-painted portrait of Earl Temple (1868) by Hoare of Bath, was originally in the Stowe Collection; it had recently been in the collection of Mr. Ladd Betts. The Earl of Chatham (1868), by Brompton, a part repetition of the engraved picture at Chevening, was presented by Earl Stanhope. Lord North (275), a small but effective crayon drawing, attributed to Nathaniel Dance. George Canning, a fine bust by Chantry (1869). John Wilkes, the politician, a delicate and full-length drawing by Earlom, the engraver, was presented (1869) by William Smith, Esq., Deputy-Chairman of the Board of Trustees. Sir Thomas More (1870), an early copy of the well-known picture by Holbein, was first exhibited in the Gallery on the 300th anniversary of the day of his execution

on Tower Hill. Richard Cobden (1870), a large full-length portrait, seated in his library, painted by Lowes Dickinson, was presented by a committee of 474 gentlemen, all members of the Reform Club.

Of the clergy there is a considerable number, and many of those who played a leading part in the political and literary history of the country. The Seven Bishops of 1688, assembled in one picture (1859), arranged, according to the taste of the day, in circular compartments, were repeated in various engravings and on a large silver medallion already mentioned. Tillotson, by Mrs. Beale (1860). Cardinal York, the last of the Stuarts, an admirable specimen of Pompeio Batoni as a portrait-painter (1861). Whitefield preaching, a group of small figures by Woolaston, in the style of Hogarth (1861). John Wesley preaching, a half-length figure, in his natural hair (1861), painted by N. Hone. Dr. Paley (1862). Dr. Horsley (1863). Dr. Wolcot, Peter Pindar, a delicate miniature by Lethbridge (1863). Bishop Burnet (1863). Archbishop Laud, a fine old copy by Stone, from the Lambeth picture, formerly in the possession of Copley the artist (1864). Peter Martyr Vermilius (1865). Cardinal Pole, a delicate and well-preserved picture, one of the most genuine of him in this country (1866). Bishop Juell (1867). Whiston, the translator of Josephus (1867). Cardinal Howard, a small oil-painting on metal (1867). Dr. Dodd, author of the 'Beauties of Shakspeare,' who expiated the sin of forgery on the scaffold—a characteristic painting by Russell (1867). Dean Buckland, especially celebrated as a naturalist, and one of the earliest professors of geology, a bust presented by H. Weekes the sculptor (1868). Plunkett, titular archbishop of Armagh, executed at Tyburn (1868). Archbishop Sancroft, a small and delicate crayon drawing by E. Lutterell, which formerly belonged to Archbishop Sutton at Lambeth Palace, and afterwards passed into Lord Canterbury's possession (1870). The two martyrs, Latimer and Ridley, were procured from an old manor-house at Canterbury (1870). They are of little value as paintings, but belong to the 16th century, and accord in personal appearance with other authentic portraits of the same individuals.

Dr. Watts, the eminent author of 'Divine Songs,' painted by Kneller, and several times engraved, affords an interesting study for the physiognomist (1868). Although far from inspired, there is something very engaging in the countenance. Huntington (1860), painted by Pellegrini in 1803, has on the other hand very little to recommend him. His coarse, vulgar face, is rendered more repulsive still by a closely-cropped low-fitting wig. The attitude as he sits at the table is strained and sprawling.

Among the lawyers may be distinguished Sir Nicolas Bacon, Queen Elizabeth's keeper of the great seal, and father of the great Lord Bacon (1863), painted by some unknown hand, found in a country parsonage in perfect condition; the small size of the gilded purse to contain the great seal is remarkable. Judge Jeffreys (1858) a handsome and youthful face, before intemperance had begun to tell upon it. He wears the red robes of recorder of the City of London. Dunning, Lord Ashburton (1860), one of the few portraits which Sir Joshua Reynolds painted with colours that he knew would withstand the

injurious effects of time. Lord Chancellor Thurlow (1867), painted by Phillips, and the last he ever sat for, represents him as the broken-down old man, with white eyebrows, and totally different from the portrait of him at Longleat, where his eyes glare from beneath dense thickets of the blackest eyebrows, and his portly figure is enveloped in the embroidered folds of the chancellor's gown. The two great brothers, Eldon and Stowell, are represented in marble busts (1864 and 1867), the latter from the College of Advocates at Doctors' Commons. The latest of the Chancellors, Lord Cranworth, appears in an admirable likeness in a refined and pale-toned picture by G. Richmond (1869). The picture was bequeathed to the nation in accordance with Lady Cranworth's particular desire.

Of military heroes we may select the following: Marlborough, painted when quite young, by old Wyck (1862). Monck, Duke of Albemarle (1863), similar to the head of an unfinished miniature, beautifully painted by Cooper in the royal collection at Windsor. Lord Heathfield (1864), a vigorous study by Copley, for his picture at Guildhall, and instructively illustrative of Reynolds' portrait of the great commander in the National Gallery. General Washington, a small and delicate crayon drawing, done from the life by Mrs. Sharples, and presented by Mr. James Yates, the well-known scientific writer. Two portraits by Gainsborough of Amherst (1862), and Cornwallis (1869), are painted with extreme sketchiness, but, at a short distance, produce a wonderful effect. A vigorous picture of Marshal Beresford has recently been presented by Mr. A. J. B. Beresford Hope, M.P. (1870). Two small full lengths in water colours, of Wellington, by Edridge (1870), and the Marquis of Anglesey, by Bauzit (1870), afford, both by scale and an elegant style of execution, a pleasing variety to the larger and heavier kind of oil paintings which predominate, whilst, at the same time, all the conditions of truthful portraiture are fulfilled.

The principal naval portraits are Admiral Keppel (1864), a magnificent picture by Sir Joshua Reynolds, for Keppel, and designed as a present for his friend and advocate Dunning, after the trial at Portsmouth. Nelson (1859), by Füger, an eminent German artist, painted whilst Nelson, Lady Hamilton, and the Queen of Naples, were at Vienna, after quitting Sicily. It contrasts singularly as a rendering of the hero's weatherbeaten countenance, with the well-known portraits by our native artists, Abbot, Hoppner and Devis. The pictures of him done in Sicily, by Guzzardi, are numerous; they are harsh in the extreme, and flat, like the performances of China or Japan. Lord Exmouth (1862), a large and very weak production by Northcote, was presented by his son, the late Dean of Norwich.

The list of authors, including poets, historians, and essayists, is very copious. We cannot attempt more than to enumerate those added since our last notice, preserving the order in which they quitted the scene of action, and giving, as usual, the date at which the portrait was acquired. Shakespeare, a fine impression of the engraving by Droeshout, from the first edition of his plays (1864). Quarles (1869). Cowley (1859). Stanley, historian of philosophy (1863). Butler, author of 'Hudibras' (1867). Waller, in old age

(1862). Dryden (1858). Pepys, author of the 'Diary,' formerly the property of Peter Cunningham (1866). Addison (1869). Prior (1860), presented by the late Earl of Derby. Congreve (1859), Steele (1863). Pope, a fine full length by Jervas, from the Watson Taylor and Lord Bessborough collections (1860), and a crayon drawing by Hoare, bequeathed by the Rev. Mr. Townshend (1870). Richardson, the novelist (1863). N. Hooke, the historian (1859). Churchill, the satirist (1863). Goldsmith, this picture painted in the school of Reynolds, belonged to Goldsmith himself (1861). Colman the elder (1859). Kirke White, a medallion by Chantrey (1860). Dibden, the song writer (1860). Byron, in Albanian costume, by Phillips (1862). Keats, a small whole length by Severn (1858), and a fine bust portrait by Hilton (1865). Sir Walter Scott, painted by Graham Gilbert, presented by the widow of the artist (1867). O'Keefe, by Laurenson (1863). Coleridge, when young, by a Flemish artist named Van Dyke, a friend of Sir Joshua Reynolds (1865), and a larger painting of him taken at Bristol by the celebrated American artist, Washington Allston (1864). Southey, a head by Mr. Van Dyke (1865), also a small full length drawn by Edridge (1861). Campbell (1865), presented by the Duke of Buccleugh. Fraser Tytler, the historian, well painted by Mrs. Carpenter (1867). Lord Jeffrey, the reviewer, a poorly executed bust by Park (1861). Wordsworth, a large full length by Pickersgill (1860). Tom Moore, a bust (1861). Professor Wilson, "Christopher North," and De Quincey, the opium eater, both by Sir Watson Gordon, and presented after his decease by his brother (1865). Lord Macaulay, a bronze medallion from the studio of Baron Marochetti (1868). Douglas Jerrold, presented by his friend Hepworth Dixon (1869). W. Savage Landor, bequeathed by H. Crabb Robinson (1867). Leigh Hunt, a vigorous painting by his friend, B. R. Haydon (1869). The latest acquisition made by the trustees was a portrait of Charles Dickens, painted from the life by Ary Scheffer, the great French historical painter, in 1853. It is known that they desired to obtain a portrait of Dickens in early life by Maclise, but it was sold at the sale of his effects in July last at a high price and fell into private hands.

The portraits of artists, including painters, sculptors, architects, and engravers, have been increased as follows: Dobson, "the English Tintoret," by himself (1870). Sir Christopher Wren (1860), one of Kneller's best works and doubly signed, from the Bessborough collection. Hogarth, a spirited terracotta bust, by Roubiliac (1861); also the famous little full-length of himself, seated at his easel (1869). Frank Hayman, painting Sir R. Walpole (1866). Mortimer, a small whole length (1867). James Stuart, the author of 'Antiquities of Athens,' a small and beautifully-finished miniature (1858). Roubiliac modelling a statuette of Shakespeare, cleverly painted by Carpentier (1870). James Barry, by himself (1866). Sir Francis Bourgeois, chiefly known in connection with the magnificent collection of pictures at Dulwich (1867). Bartolozzi (1866). Gillray (1859). Cosway, a delicate miniature by himself (1870). Flaxman, by Romney, presented by one of his executors, H. Crabb Robinson (1860). Blake,

a spirited portrait by Phillips, one of his very best works (1866). Sir T. Lawrence, a bust by Behnes (1867). Northcote (1862). Chantrey (1859). Haydon (1868). James Ward, the animal painter (1870); and John Gibson, the sculptor, by Mrs. Carpenter (1867).

The luminaries of science embrace various departments; several of whom, as members of the church and deeply-read lawyers, might have been looked for in other classes. They comprise, the medical profession, philosophers, travellers, engineers, mathematicians, and philanthropists. Sir William Butts, physician to Henry VIII. (1866). Dr. Harvey, the discoverer of the circulation of the blood (1859). Cocker, the arithmetician (1868); Hobbes, of Malmesbury, presented by Sir Walter Trevelyan (1867). Locke (1860). John Law, inventor of the Mississippi scheme (1865). Howard, the philanthropist (1860). Smeaton, of the Eddystone Lighthouse (1859). John Hunter, the comparative anatomist (1859). Bruce, the Abyssinian traveller (1860). Dr. Darwin (1859). Woodfall, the reporter (1864). Dr. Priestley, a small crayon drawing by Mrs. Sharples (1864). Herschel (1860). Jenner (1859). Sir Stamford Raffles (1859). Jeremy Bentham, when only 13, a full length by Fry, presented by his secretary, Sir John Bowring (1865). Lancaster, founder of the educational system which bears his name (1860). Dr. Arnold, a marble bust, presented by the late Bishop of Manchester (1864). Sir Charles Bell, the physiologist, presented by his widow (1859). Mrs. Fry, a miniature by Miss Drummond (1861). James Watt, presented by Mr. Matthew Boulton (1864). Clarkson, the slave-trade abolitionist, bequeathed by H. Crabb Robinson (1867). These two last were painted by Breda, a foreign member of the Royal Academy of London. George Stephenson, the engineer, a marble bust by Pitts (1868). Brunell, with the Thames-tunnel in the background, poorly painted by Drummond (1859). Father Mathew, "The Apostle of Temperance," painted by Leahey (1865). This series of investigators and discoverers is appropriately closed (1868) with Michael Faraday, painted by Phillips, when the great philosopher was in the fulness of his power, and as he so often appeared during his lectures at the Royal Institution. A furnace is in the background, and the electric battery is significantly placed beside him.

The portraits of ladies next claim attention, and they are very varied in character. The old Countess of Shrewsbury, "Building Bess, of Hardwick," as she was called, in full black dress and ample ruff, personifies the shrewish wife of the jailor of Mary Queen of Scots, at Sheffield and Hardwick. This picture (1865) is the counterpart of one still preserved at Hardwick and engraved in Miss Costello's 'Celebrated Englishwomen.' The Countess of Pembroke, "Sidney's sister, Pembroke's mother" (1859), a calm and dignified figure, seated, in the embroidered and fanciful costume of the period of the reign of James I., is one of the most favourable specimens of the powers of Marc Gheerards, who is principally known by his portraits of Queen Elizabeth at her latest period of life. This picture is dated March, 1614, "the cold year," with a wreath of flowers, and the motto, "No spring till now." It had been sold to the previous possessor as Anne of Denmark. Lady Carleton (1860), a picture of the same period, is

in admirable preservation. This lady appears in the collection upon claims distinctly her own, although her husband's portrait was presented at the same time. She performed several voyages abroad, and negotiated various business transactions of importance, including the purchase of a large collection of works of art in which Charles I. took interest. A charming little chalk drawing of Lady Temple, by Hamilton (1867). in a quaint oval painted frame, had been formerly at Strawberry Hill. It was found in obscurity, in the shop of a small dealer. The beautiful and symmetrical features of the Duchess of Queensberry have, since the acquisition of her portrait (1867), engaged continual admiration. That she was, as Walpole wrote of her, "Prior's Kitty, ever young," to a very late period of her life, was shown by a portrait taken shortly before her death, and exhibited in the Portrait Exhibition at Kensington, 1867. But the beauty of this face has been superseded by a more recent acquisition in the portrait of Nelson's Lady Hamilton, by Romney (1870). Similar as the features are in many respects, there is more indication of genius and sensibility on the part of Lady Hamilton. The picture is simplicity itself. A plain white dress, and a white drapery rolled like a turban round the head, complete the costume. The figure is half-length; she rests on her elbows, and looks up with her large full eyes beaming with tenderness. She surely, after doing what she did to aid the British fleet in Sicily, deserved a better fate than to die an outcast, in extreme poverty, at Calais.

For purposes of comparison, as affording two other examples of female beauty, it may be allowable to take the small class of actors' portraits next in order. The earliest of these, according to the date of decease, is Mary Davis (1867). She was a popular singer and dancer, and became grandmother to the Earl of Derwentwater, who suffered at the time of the Scottish Rebellion. Pepys, in his diary, speaks frequently of "Moll Davis." The picture is remarkably different from all other portraits of actresses or royal favourites of this period. It is treated with a simplicity and purity suited rather for a devotional closet or altar-piece than as the picture of a woman devoted to the frivolities of the court of Charles II. The countenance is refined and of a classical stamp. The raised hand is painted with the delicacy and mastery of Carlo Maratti, betraying therein the influence of the school of Guido, derived from the Caracci. There is a similar composition to this, engraved by Valcke, only with a different face, which professes to represent Hortense Mancini. The countenance of Nell Gwynne (1867) is not beautiful, but it has a shrewdness and an archness of expression which would obtain more admirers than the more regular and classic features of the ladies we have last been discussing.

The picture of Nell Gwynne, seated on a rock and pointing sideways with one hand, exhibits a style of composition that must have been very popular in Lely's own time. There are numerous repetitions of it, constantly the same in figure and background, but always with a different face. In fact it appears as if the artist had kept duplicates by him of this picture ready painted, saving the face, and this blank was filled in according to the features and taste of the new-comer.

The portrait of Garrick, by R. Edge Pine (1859), was formerly the property of Sir Richard Sullivan. The object of a collection like this is to represent individuals as they really were, so as to enable the spectator to judge of their actual features, and not, as the actor desires occasionally to do, to sink his own individuality and adopt the look and expression of a totally different person. In this picture of Garrick the object is doubly attained. He wears the costume of everyday life, and, sitting in a chair reading the play of Macbeth, turns to the spectator, with such animation of countenance as indicates that he is impressed with one of the stirring incidents in the play. Pine painted the picture a second time with variations, and both compositions have been engraved. Mrs. Garrick thought so well of the one now in the National Portrait Gallery that she used to come once in the course of a year to Sir R. Sullivan's, on the banks of the Thames, and always requested to be allowed to be left alone with it. A small portrait bust, in bronze, of J. P. Kemble, an early work of John Gibson, was presented by the sculptor to the Gallery (1862). He had, as a young man, been deeply impressed with the performances of the tragedian, towards the close of his career, at Liverpool.

The collection has already been the means of drawing forth from obscurity the names of many artists of talent in their day, whose works, as soon as finished and paid for, were consigned to some family residence and never once thought of for public exhibition. Such men as Nathaniel Hone, Wright of Derby, T. Beach, and L. Abbott, are scarcely known, even by name, although their works, as regards careful execution and force of character, deserve a very high place in the history of art in this country.

Arrangements have been made, since the removal of the collection to more commodious premises, to permit students, under certain necessary limitations, to make copies, or rather studies, from the pictures now in the Gallery. The projection of the screens into the room, and the railings round them, reduce the space available for visitors very considerably. Consequently those artists who may obtain permission through the secretary to make particular studies, must leave off working at 1 o'clock each day.

The change of locality has greatly increased the number of visitors. The new Gallery was first opened in March 1870, and between that period and the end of September 40,997 visitors entered the Gallery; out of these 5218 were admitted on private days, after paying 6*d.* at the entrance to the Museum galleries. The number of visitors at Great George Street during the corresponding months of 1869 was 17,060, yielding in total during the present year an excess of 29,155 visitors.

THE ARMED FORCES OF EUROPE:

THEIR FORMATION, COST, STRENGTH, AND ORGANISATION.

THERE are, at present, three systems in existence under which the armed land forces of the various countries of Europe are raised. They are:

1. Voluntary Enlistment;
2. Conscription, enforcing the service of arms on part of the population;
3. National Armament, enforcing the service of arms on the whole of the population.

The first of these systems, Voluntary Enlistment, formerly general throughout Europe, is now carried out in its fulness solely in one country, the United Kingdom. To the second system, Conscription, adhere, with modifications, branching out on the one side towards Voluntary Enlistment, and on the other towards National Armament, the bulk of the states of modern Europe. By Conscription are raised the armies of, 1. Austria, 2. Belgium, 3. France, 4. Greece, 5. Italy, 6. Netherlands, 7. Portugal, 8. Russia, 9. South German States, 10. Spain, 11. Sweden, and 12. Turkey. Finally, the third system, that of National Armament, exists in four countries—imperfectly developed in the first two, and fully in the two last—namely: 1. Denmark, 2. Norway, 3. Prussia, inclusive of the states of the North German Confederation, and 4. Switzerland. Adhering to the order and classification here given, the following statistical account is put forth as a brief survey and description of the military constitution of the different countries of Europe.

VOLUNTARY ENLISTMENT.

United Kingdom.—Military service has always been voluntary in England, the army being considered secondary in importance to the navy, for which impressment may be resorted to, under the sanction of an Act of 2 Ric. II. cap. 4, incidentally recognised by subsequent statutes. It has been the tendency of later times to offer increasing attractions for voluntary enlistment by augmenting the pay and shortening the time of service in the army. By an Act passed in the session of 1870 (33 & 34 Vict. cap. 67) a recruit has the choice of enlisting either for "long service," or for "short service." As regards the "long service," he may enlist for twelve years in the regular army, at the end of which, if he has conducted himself well and is allowed by his commanding officer, he may re-engage for nine years more to complete a service of twenty-one years. On his discharge, after completing the twenty-one years, he will receive a pension for life. As regards "short service," a recruit may enlist for six years in the regular army, and six years in the first-class reserve. After the first six years are passed he will be able to return to civil life, to live wherever he likes within the United Kingdom, and to follow any

trade or occupation he pleases. During the last six years he will receive the pay of 4*d.* a day, in return for which he will be liable to be drilled occasionally, but the Act provides that the times shall be so arranged as to interfere as little as possible with his ordinary trade or occupation. As regards the classes of the population from which the army is drawn at present, they are shown in a parliamentary return issued in the session of 1867, giving the results of recruiting for several years. It appears from this statement that of every 1,000 recruits 563 came from England and Wales, 112 from Scotland, and 320 from Ireland; while of every 1,000 men that offered themselves, 386, or more than one one-third, were rejected as unfit for military service. Of every 1,000 applicants, 618 were labourers or servants, 175 out-door artisans, 142 in-door artisans, and 65 shopmen or clerks. Other parliamentary returns, recently issued, referring to a sort of educational census of 182,932 soldiers in the army, show 6·80 per cent. with a superior education, and a further 63·67 per cent. able to read and write. Of the remaining 29·52 per cent., 16·55 could read but not write, and 12·97 could neither read nor write. In the infantry of the line the proportion of uneducated men, or men not found able both to read and write, was 45·52 per cent. in 1860, but only 35·71 in 1865.

The system of voluntary enlistment for the army of the United Kingdom has deep roots in the constitution of the realm. It is declared in the Bill of Rights of 1690 that "the raising or keeping a standing army in time of peace, unless it be with the consent of Parliament, is against law." The constitutional principle thus laid down is guarded with the utmost strictness, and Parliament, in giving its consent to the maintenance of a standing army, extends it never over one year, reserving to itself the formidable power of extinguishing the force by a couple of votes. It is in two distinct ways that the parliamentary consent is annually given; first, in the voting of the so-called Mutiny Bill, without the existence of which soldiers would be liable merely to the civil tribunals, and amenable to no other laws than the rest of the Queen's subjects; and, secondly, by the grant of the necessary funds for defraying the expenditure on the army. The probable expenditure of each coming year has to be most minutely specified by the Secretary of State for War, and is submitted to the House of Commons, in so many votes, in the Army Estimates.

The Army Estimates for 1870–71 contain twenty-seven votes, seven of them relating to the "regular forces;" four to "reserve forces;" seven to stores, works, and buildings, and "various services;" and nine to "non-effective services." The total cost of the army for the year was set down in these last estimates at 13,093,500*l.*; but a supplementary vote, passed at the end of the session, after the outbreak of the war between France and Germany, granted 2,000,000*l.* "towards defraying the expenses in maintaining the naval and military services of the kingdom." Adding one-half of this grant, destined for both services, to the Army Estimates of 1870–71, the latter amounted to a little above 14,000,000*l.*, thus representing about one-fifth of the national expenditure. The "regular forces," to be maintained out of this sum in the year 1870–71, are given as follows in the Army Estimates:

Regular Forces.	Officers.	Non-commissioned Officers, Trumpeters and Drummers.	Rank and File.
Officers on the General and Departmental Staff	1,239	..	..
Regiments:			
Royal Horse Artillery	78	138	1,834
Life Guards and Horse Guards	81	192	1,029
Cavalry of the Line	475	969	7,733
Royal Artillery	661	1,550	12,866
Riding Establishment	7	13	205
Royal Engineers	393	564	3,879
Army Service Corps	8	386	1,801
Foot Guards	237	453	5,220
Infantry of the Line	2,934	6,468	51,990
Army Hospital Corps	1	165	694
West India Regiments	104	150	1,680
Colonial Corps	58	149	1,632
Total regiments	6,276	11,197	90,363
Depots of Indian Regiments:			
Cavalry	27	54	513
Infantry	200	600	5,000
Total Indian regiments	227	654	5,513
Recruiting and teaching establishments	23	85	62
Training schools and factories	59	331	17
Grand total	6,585	12,267	96,955

In the Army Estimates laid before Parliament there is a strict line drawn between "regular forces" and "reserve forces," the latter consisting of four classes: militia, yeomanry, volunteers, and army reserve. The sums granted for the maintenance of these "reserve forces" are very small, the estimates of 1870–71 giving 720,000*l.* to the militia, 81,900*l.* to the yeomanry, 412,400*l.* to the volunteers, and 68,000*l.* to the army reserve. Measured by the scale of allowances, it can scarcely be said that much importance is attributed to these "reserve forces of the army," not one-tenth of the total of the estimates being given to this branch of the military service.

In round numbers, every soldier of the standing army costs the country 100*l.* per annum. But this sum includes all extraneous military expenses, as well as the disbursement for the "non-effective services." A return on the cost of the army was made by the War Office in March 1863, showing the amount allowed each soldier for pay, beer money, clothing, fire, forage, and other allowances. The annual cost of a gunner, sapper, or private in the following corps is—Royal Horse Artillery, 55*l.* 6*s.* 1½*d.*; Life Guards, 68*l.* 16*s.* 8½*d.*; Horse Guards, 63*l.* 14*s.* 2½*d.*; Cavalry of the Line, 52*l.* 11*s.* 3½*d.*; Royal Foot Artillery, 32*l.* 6*s.* 11½*d.*; Royal Engineers, 31*l.* 5*s.* 3¾*d.*; Military Train, 31*l.* 15*s.* 9¼*d.*; Foot Guards, 28*l.* 17*s.* 7¾*d.*; and Infantry of the

Line, 26*l.* 3*s.* 5½*d.* According to Colonel W. H. Sykes, M.P.,* the average cost of maintenance of the English soldier, taking pay, clothing, and provisions together, is 78*l.* 18*s.* 5*d.* per head, while that of the French soldier, similarly calculated, is but 37*l.* 2*s.* 6*d.* per head. Taking pay alone, the average cost of the English soldier is 33*l.* 15*s.* 3*d.*, and that of the French soldier 16*l.* 13*s.* 4*d.*, per head. "The French government," says Colonel Sykes, "maintain two soldiers for a trifle more than it costs the English government to maintain one soldier."

Conscription.

1. *Austria.*—The armed forces of Austria—or, as officially styled since November, 1868, the "Austro-Hungarian Monarchy"—are raised entirely by conscription, the mode of which differs however in the two politically divided portions of the empire, "Cisleithania," or German Austria, and "Transleithania," or Hungary. As regards the former, it is ordered by the army organisation law of 1868, which came into operation in 1869, that a certain portion, fixed annually by imperial decree, of all young men who have reached the 20th year of age, shall be drawn for the standing army, to serve during a term of ten years, three of which must be spent in active service and the rest in the reserve. The right to purchase substitutes, very prevalent formerly, was abolished by the same law, but, as a compensation, many classes of the population, such as clergymen, government officials, professors, doctors, lawyers, eminent merchants and manufacturers, and great landowners, were freed from the general liability to military service. Moreover, young men of culture, able to pass a slight examination, were allowed to give one year's volunteer service in the army as an equivalent for the ordinary term. The law of 1868 was only partly introduced in Hungary, the Diet of which had previously, in April, 1867, enacted that the term of active service in the army should be six years, with no subsequent military liability. There existed, previous to 1869, a system of national armament in that part of the empire known as the "military frontier," all men above 20 and up to 60, capable of bearing arms, being liable to service, and the troops thus raised were regularly trained and exercised. But in consequence of energetic remonstrances of the Hungarian Diet, jealous of the power thus given to the Emperor-King, the army organisation of the "military frontier" was abolished, and placed on the same footing as that of Hungary.

The armed forces of Austria comprise, besides the standing army, a militia called the Landwehr, and there is further provision made for a general levy, known as the Landsturm. But there exists no connection between the standing army and the Landwehr, the military duties of which are limited to the respective divisions of the empire, from which the corps are drawn. The nominal term of service in the Landwehr, which is asserted to be as yet very indifferently organised, is twelve years. As to the Landsturm, brought, like the Landwehr,

* 'Comparison of the Organisation and Cost in Detail of the English and French Armies,' by Colonel W. H. Sykes, M.P., in 'Journal of the Statistical Society of London,' March 1864.

into life by the army law of 1868, it can hardly be said to exist otherwise than in theory, the entry into it being compulsory only in the Tyrol, and voluntary in the rest of the empire.

According to the last official returns, the Austro-Hungarian monarchy has a standing army, inclusive of troops of reserve, of 270,470 men, which number can be raised, on the war footing, to 838,700 men. The organisation of the army was made up as follows in 1870:

Description of Troops.	Number.	
	Peace Footing.	War Footing.
Infantry:		
80 Regiments of the line, each composed of 3 field battalions, 2 reserve battalions, and 1 depot battalion	121,840	485,440
14 Military Frontier regiments, 6 of 3 and 8 of 4 battalions	12,307	53,823
1 Regiment of Kaiser-jager, of Tyrol, and 33 battalions of Feld-jager	20,251	54,463
12 Companies of ambulance and hospital service	1,180	3,876
Total of infantry	155,578	597,602
Cavalry:		
14 Regiments of dragoons, 12 heavy, and 2 light; 14 regiments of hussars; and 2 regiments of lancers	35,793	58,794
Artillery:		
12 Regiments of field-artillery, each of 14 batteries of 8 pieces	17,880	43,836
12 Battalions of fortress, and 2 battalions of mountain artillery	7,778	18,938
Total of artillery	25,658	62,774
Engineers and Train:		
2 Regiments of génie, each of 4 battalions	4,662	13,240
1 Regiment of pioneers, of 5 battalions	2,803	7,747
54 Squadrons of Fuhrwesen, or train	2,401	24,147
Total of engineers and train	9,866	45,134
Miscellaneous establishments	23,858	33,762
Total, inclusive troops of reserve	278,470	838,700

The cost of the standing army of the Austro-Hungarian empire for the year 1869 was given at 7,451,450*l.*, of which amount 6,977,769*l.* was set down as ordinary, and 473,681*l.* as extraordinary expenditure. Thus the sum of 26*l.* 15*s.* represented the average cost of each Austrian soldier.

2. *Belgium.*—A law passed by the Belgian Chambers in April 1868, fixes the strength of the army at 40,000 on the peace footing and 100,000 on the war footing. The troops thus formed are raised

by conscription, to which all able-bodied men who have completed their 19th year are liable, with permission, however, to purchase substitutes. The term of military service is fixed by the law of 1868 at eight years, but two-thirds of this period are usually allowed on furlough, reducing the actual service time to less than three years.

The strength of the Belgian army is given in the government returns on the war-footing, and is nominally as follows:

	Men.	Horses.	Guns.
Infantry	74,000	..	..
Cavalry	7,903	6,572	..
Artillery	14,513	4,050	152
Engineers and train . .	2,354	..	..
Total, without officers	98,770	10,622	152

Except for a short period at the commencement of the war between France and Germany, the strength of the troops actually kept under arms in Belgium during 1870 was not above 38,000; the number comprising 24,500 infantry, 5000 cavalry, and 8000 artillery and engineers with train.

The cost of the Belgian army in each of the years 1869 and 1870 was set down in the budgets at 1,480,000*l*., thus giving an average expenditure of 38*l*. 18*s*. per head of the troops under arms.

3. *France.*—Conscription had its origin in France. When, in the year 1793, the newly-founded republic appeared on the brink of ruin, and the country a prey to foreign invasion, it was resolved by the National Assembly that the old system of hiring troops should be abandoned, and that the mass of citizens should take the place of the cohorts engaged to fight for the *solde*. The model of ancient Rome being constantly before the eyes of the leaders of regenerated France, they decided on imitating also the Roman mode of raising armies, by means of the *conscriptio* and the *legio*,—the enrolment of the names of all men capable of bearing arms, and the choice of a certain portion of them for actual service in the field. The system was inaugurated by two decrees of the National Assembly of the 23rd of August and 7th of September, 1793, under which all Frenchmen were made liable to be impressed in the standing army by "military requisition." A further law of the 19th fructidor, year VI. of the Republic (5th September, 1798) expanded more in detail and on the basis of permanency the new method of raising soldiers, which now for the first time obtained the name of "conscription." It was ordered that all men between the ages of 20 and 25, capable of fighting, should have their names enrolled, and that a certain portion of them, fixed by the government from time to time, should become soldiers, the lot, recurring annually, deciding the choice. The system worked well, and under it there arose armed hosts of a magnitude such as Europe had not seen since the time of the Crusades. In the summer of 1795, two years after the establishment of conscription by the National Assembly, republican France had in the field no less than

ten armies, of a total strength of 959,190, which number was increased after the law of the 19th fructidor to 1,100,000 men. And frightful as was the slaughter of the years following, conscription, grasping with iron hand deeper and deeper into the sinews of the nation, kept the number of Frenchmen under arms steadily to a million, so that Napoleon, when setting out on his fated tramp into the snowfields of Russia, could boast of being at the head of 1,200,000 soldiers of *la grande nation*. The Emperor laid down a notable maxim in conscription, namely, that "*Un million d'âmes fournit chaque année* 7,000 *à* 8,000 *conscrits*." Nor was he reluctant, the great Emperor, of holding to his principle, and rigorously exacting his from 7,000 to 8,000 recruits from the million "souls."

The French law of conscription, introduced under the first republic, has remained in principle the same to the present time, its greatest modification occurring in 1868, when the vast military successes of Prussia induced the Emperor Napoleon III. and his ministers to make some approach towards the system of national armament. By the Army Reorganisation Act of 1868, the armed forces of France were classed under three divisions, as the "Active Army," the "Army of Reserve," and the "National Garde Mobile." The law of 1868 fixes the duration of service in the Active Army at five years, at the expiration of which time the soldier has to enter the Reserve for four years longer. The period of service of the men who have not been comprised in the Active Army is four years in the Reserve and five in the National Garde Mobile. An annual law on the subject divides each class called to draw in the conscription into two portions, one of which is incorporated in the Active Army while the other forms part of the Reserve. The duration of service in the Active Army as well as in the Reserve counts from the 1st of July of the year in which the young men have been inscribed on the rolls of the corps. In time of peace, the soldiers who have completed their period of service receive their liberation from the 30th of June of each year; but they only receive it, in time of war, after the arrival of the corps of the contingent destined to replace them. The men drawn for the Active Army are permitted to get substitutes, furnished, at a price fixed every year, by the government; but the privilege is withheld from the men of the Reserve. However, they may permute with those of the National Guard, or furnish as substitute a man under 32 years of age, fulfilling the conditions required for military service and liberated from all other obligations. Soldiers under arms are not admitted to exoneration, but they may get themselves replaced by soldiers of the same arm who have entered their fifth year of service.

The second division of the armed forces of France, the Army of Reserve, was returned as numbering 200,000 men; and the third division, the National Garde Mobile, of a strength of 390,000 men at he commencement of the year 1870.

According to returns of the French government, issued in the summer of 1869, the Standing or Active Army at that time numbered 404,192 men, with 86,368 horses, which strength would be increased on the war footing to 758,627 men, and 143,888 horses. The following is a summary of the numbers as given in the official returns;

	Peace Footing.		War Footing.	
	Men.	Horses.	Men.	Horses.
Staff	1,773	160	1,841	200
Infantry	252,652	324	515,937	450
Cavalry	62,798	48,143	100,221	65,000
Artillery	39,882	16,646	66,132	49,838
Engineers	7,486	884	15,443	1,400
Gendarmes	24,535	14,769	25,688	15,000
Troops of the Administration	15,066	5,442	33,365	12,000
Total	404,192	86,368	758,627	143,888

The cost of the French army stationed at home amounted, in the year 1868, to, in round numbers, 19,000,000*l.*, including non-effective services. In the financial year 1868–69, the army estimates of the United Kingdom showed an expenditure of 15,455,400*l.* for effective and non-effective services. As before stated, p. 158, the French soldier of the standing army is calculated to cost 37*l.* 2*s.* 6*d.* per head per annum, as compared to 78*l.* 18*s.* 5*d.* expended on the British soldier.

4. *Greece.*—The system of conscription was adopted by Greece in its struggle for independence, a decree of the President, of the 27th of February, 1827, ordering the formation of a regular army on the French model. With a foreign king came foreign troops, still incorporated in large numbers with the natives in the standing army. The conscription as now existing does not press severely on the people, and the privilege of buying substitutes is made use of to a very large extent among all but the poorest class of agriculturists. A law of army organisation passed by the Greek Chamber in March, 1867, ordered that the standing army should be raised to 31,300 men, comprising 14,300 regular, and 17,000 irregular troops. But the last returns show that there are in actual service not more than 8,457 men, made up of the following description of troops:

	Officers.	Men.
10 Battalions of infantry	280	6,980
4 Squadrons of cavalry	23	381
5 Companies of artillery	26	466
1 Company of sappers and miners	4	92
1 " " artillery workmen	4	127
Staff	43	31
Total	380	8,077

The cost of the Greek army in the year 1869 was given in the budget estimates at 8,070,507 drachmas, or 288,232*l.* The pay of a private soldier is 42 lepta, or nearly 4*d.*, daily, but the soldier only receives 16 lepta, or 1½*d.*, in cash, the remaining 26 lepta being retained for payment of his mess and other purposes. The ration of bread, which he receives over and above this allowance, is computed to cost the country 24 lepta per head, and the clothing about 20 lepta daily. In the budget estimates for 1869, the total cost of the army is set down at 288,232*l.*, or 33*l.* 19*s.* per head of the troops under

arms. "But," says the late Mr. Edward Herbert, British Secretary of Legation, in a report dated Athens, March 20, 1869,* "in speaking of the military expenditure of Greece it would be idle to base any conclusions on the ordinary budget, or indeed to offer any opinion on the subject, unless it were possible to examine at the same time the application of the extraordinary credits, of which scarcely any account has yet been rendered, or seems likely to be rendered to the Greek nation."

5. *Italy.*—The Sardinian law of military organization, modelled closely on that of France, was adopted for the monarchy when the ruler of Sardinia became King of Italy. The law orders that a certain portion of all the young men of the age of 21, the number varying from 40,000 to 50,000, is to be levied every year for the standing army, while the rest are entered in the army of reserve, in which they have to practise annually for forty days, and are then sent on illimited furlough, but can be called permanently under arms at the outbreak of a war. The time of service in the standing army is ten years, on the implied condition of the men being sent on furlough, in time of peace, for one-half the period. In some branches of service, the members of which are distinguished as "Soldati d'ordinanza," to which class belong the Carabinieri and a few of the Administrative corps, the men have to serve eight years complete, and are then liberated. In the Army of Reserve the time of service is five years. Every native of the kingdom is liable to the conscription, to be enrolled either in the standing army or the reserve. An exemption in favour of young men studying for the priesthood was repealed by a law which passed both houses of the Italian Parliament in May 1869.

A return of the minister of war gives the actual strength of the army in 1869, and its expansion on the war footing, as follows:

—	Number of Men under Arms (Peace Footing.)	Number of Men on Furlough.	War Footing.
Infantry of the line . .	118,850	184,272	303,122
Bersaglieri	14,727	21,448	36,175
Cavalry	16,165	9,604	25,769
Artillery	17,202	18,162	35,364
Corp of Engineers . .	3,104	563	3,667
Military Train . . .	2,454	7,151	10,605
Carabinieri	19,628	..	19,628
Administrative troops .	4,463	3,752	8,215
Military Instruction .	2,964	..	2,964
Total . .	199,557	244,952	445,509

In the financial accounts for 1869, the cost of the standing army was set down at 6,562,000*l.*, being at the average rate of 32*l.* 17*s.* per head of the soldiers under arms.

6. *Netherlands.*—Conscription was brought into the Netherlands

* 'Reports of Her Majesty's Secretaries of Embassy and Legation,' No. III., 1869. London, 1869.

by the French republican army, which conquered the country in 1794. The system was very strictly enforced under the Napoleonic rule, but relaxed afterwards, and is replaced in part by voluntary enlistment. However, on the outbreak of the war with seceding Belgium, in 1830, the military power of the kingdom was once more strained to the utmost, and for several years, up to 1833, no less than 4 per cent. of the total population were kept under arms. On the advent of peace these forces were speedily disbanded, and a law reorganising the army was passed by the Chambers in July 1839. Under it, still in force with alterations, the standing army is raised partly by conscription and partly by enlistment, in such a manner that the volunteers form the stock, but not the majority of the troops. The men drawn by conscription at the age of 20 years have to serve, nominally, five years; but practically all that is required of them is to drill for ten months, and, returning home on furlough, meet for six weeks annually for practice, during a period of four years. Besides the regular army, there exists a militia, called "Schuttery," divided into two classes. To the first, the Active Militia, belong all men from the 25th to the 34th year of age; and to the second, the "Resting" (Rustende) or Sedentary Militia, all persons from 35 to 55. The first class, numbering about 26,000 men, is again subdivided into two distinct parts, the one comprising the unmarried men and widowers without children, and the other the remaining married soldiers. The Sedentary Militia, to the number of 61,000 men, is organised in fifty-four full and nine half battalions. About one-third of the militia is made up of men who have previously served in the regular army.

The organisation and strength of the army of the Netherlands was as follows at the commencement of the year 1870, according to official returns:

	Officers.	Men.
General staff	188	..
Infantry	1,076	43,237
Cavalry	191	4,310
Engineers	102	1,023
Artillery	427	10,454
	1,984	59,024

There exists, besides the standing army, and quite independent of it, a colonial army, returned as numbering 27,449 men, including 15,182 non-Europeans.

In the budget estimates for 1870, the expenditure of the war department was given at 1,251,000*l.*, being at the low figure of 20*l.* 10*s.* per head of the 61,062 men and officers returned as composing the home forces of the standing army.

7. *Portugal.*—During the Napoleonic invasion of the Peninsula there existed a sort of national armament in Portugal, which was kept up for some years after the proclamation of European peace by the Congress of Vienna. In 1816 the government possessed a standing army of 59,325 men, but the national finances not being able to bear this burthen, a gradual decrease was effected, until the strength had been reduced to one-fourth, with entire disappearance of the

general liability to military service. At present the army of the kingdom is formed partly by conscription and partly by voluntary enlistment. Freedom from conscription may be purchased by a fixed sum, amounting to about 80*l.*, payable to the government. The time of service is eight years, of which five have to be spent in the regular army, and three in the militia. More than one-half of the standing army consists of men procured by enlistment, or who have made the military service their profession. By a law of military organisation passed on the 23rd of June, 1864, the strength of the army was fixed at 30,128 men on the peace-footing, and 68,450 on the war-footing, but financial distress prevented the execution of the scheme, and scarcely more than half the number of men required by law are kept under arms. The actual strength of the army in 1869 was reported as follows:

	Officers.	Men.
18 Regiments of Infantry of the line .	683	9,218
9 Battalions of riflemen	314	3,468
8 Regiments of lancers and dragoons .	244	2,253
3 „ of artillery	107	1,278
1 Battalion of engineers	3	317
Staff and sanitary troops	194	106
Total	1,545	16,640

In the budget for the financial year 1868–69, the expenditure for the standing army was returned at 820,574*l.*, being at the rate of 45*l.* 2*s.* per head of the 18,185 soldiers, men and officers, kept under arms.

8. *Russia.*—The system under which the armed hosts of the vast empire that comprises one-seventh of the territorial part of the globe are raised, combines to a singular degree the three methods of voluntary enlistment, conscription, and national armament. It is, however, conscription in the main, the system of national armament existing only in isolated portions of the empire, such as the territories of the Cossacks, and enlistment producing but an insignificant part of the whole body of soldiers under arms. Frequently reorganised since the Crimean war, the Russian army is at present, after the extinction of serfdom, recruited from the classes of peasants and artisans, partly and principally by means of conscription, partly by the adoption of the sons of soldiers, and partly by voluntary enlistment. Every individual of the peasant and artisan classes is, with few exceptions, liable to compulsory service, provided he be of the proper age and stature. All who possess the means are allowed to purchase substitutes, after previous consent of the local authorities. The levies, which take place alternately in the eastern and western divisions of the empire, are ordinarily in the proportion of one or two to every 500 males; but during war the proportion is at least as two or three to 500, and sometimes as much as four or even five to 500. This last, however, may be taken as the maximum levy, and is rarely exceeded. The number of recruits to be furnished by the empire in general, and by each district in particular, is fixed according to the results of the preceding census. The nobles nominate such of their dependents as they please to complete their quotas, the only condition being that

they should have a good constitution, and be of the requisite size, and not less than eighteen nor more than forty years of age. The contingents supplied by some of the great landed proprietors are very large, sometimes amounting to 3,000, to 5,000, and even to 6,000 and upwards. The recruits are first sent to the recruiting establishments, and thence forwarded to the corps to which they are assigned. Nobles, magistrates, clergymen, and students are exempted from the service. Merchants and traders enrolled in the different guilds are also exempted; as are the only sons of peasants, and peasants with more than three children. The levies furnished by the Cossacks are regulated by particular treaties; and many half-savage tribes are excused, partly on account of their diminutive size and partly because of their great aversion to a military life. Generally, it is found that a levy of two on every 500 males produces a supply of about 90,000 or 100,000 men. The period of service is fixed at twenty-two years for the guard, and twenty-five years for the other troops. But since 1840, soldiers after ten or fifteen years' service, according as they belong to the western or eastern divisions of the empire, are entitled to an indefinite leave, and are sent home to their native place, their names being enrolled in the reserve of the battalion or squadron of the regiment to which they belong, that they may, if necessary, be again called into active service.

According to the last returns of the war department, the total strength of the Russian army, including the first and second reserves, amounts to 892,648 men on the peace footing, and can be raised to 1,135,973 men on the war footing. The summary of the return is as follows:

	On the Peace Footing.	On the War Footing.
Ordinary standing army:		
Infantry	364,422	694,511
Cavalry	38,306	49,183
Artillery	41,731	48,773
Engineers	13,413	16,203
Total standing army	457,872	808,670
First reserve:		
Troops of the line	80,455	74,561
Garrison troops in regiments	80,455	23,470
" " battalions	19,830	29,892
Total first reserve	180,740	127,923
Second reserve:		
Troops of all arms	254,036	199,380
Grand total	892,648	1,135,973

Besides the regular army, Russia commands the services of a large force of irregular troops, the most important of which are the Cossacks, formed into light cavalry. Among the Cossacks exists complete national armament, all the male inhabitants of their territories capable

of fighting, between the ages of 15 and 60, being trained to arms, and bound to military service. The number of Cossacks is estimated as follows:

—	Heads.	In Military Service.
On the Black Sea	125,000	18,000
Great Russian Cossacks on the Caucasian Line	150,000	18,000
Don Cossacks	440,000	66,000
Ural Cossacks	50,000	8,000
Orenburg Cossacks	60,000	10,000
Siberian Cossacks	50,000	9,000
Total	875,000	129,000

A standing force of fifty-four cavalry regiments, each 1044 strong, numbering a total of 56,376 horse, is maintained by the Cossacks on the peace footing, the rest being left to be called upon the war footing.

The financial accounts published by the Russian government represent the expenditure for the army as comparatively small. The following, according to these official statements, was the expenditure in five successive years:

Years.	£
1862	15,948,505
1863	16,511,024
1864	22,475,954
1865	18,281,809
1866	16,656,052
Total expenditure in five years	89,873,344
Average annual expenditure	17,974,668

Taking into account only the standing army with reserves, and leaving aside the cost of the irregular troops and of military administration, the average annual expenditure here given amounts to but 22*l.* 3*s.* per head of the Russian soldier.

9. *South German States.*—Pending their entry into the Germanic Confederation, led by Prussia, in which national armament is absolute, the states of Southern Germany, Bavaria, Würtemberg, and Baden, raise their armed forces by the system of conscription. The application of it somewhat differs in the various states. In the kingdom of Bavaria, the members of the nobility, or the *hohe Adel*, are exempt from the law of conscription, to which the rest of the male population, from the age of 21, is liable. Those drawn for the army have to pass a military service of, nominally, eleven years, but are kept under arms, when on the peace footing, for only three years, passing three more in the Reserve, called out for annual training, and then remaining five years in the Landwehr, an institution decreed in 1868, but as yet existing only in theory. The kingdom of Würtemberg has no exceptions from the law of conscription, to which all men at the age of 21 are liable, no substitution being allowed. The period of service in Würtemberg is seven years, four of which have to be spent in the standing army, and the remaining three in the army of reserve. In the Grand Duchy of Baden, the liability to

conscription also is general, but substitutes are not only allowed, but provided by the government, at a rate varying from 46*l.* to 50*l.* The term of service in Baden is six years, the whole of which has to be spent in the standing army, though in peace time generally three-fourths of the men are liberated on furlough. Among the states of Southern Germany counts one more, the Grand Duchy of Hesse, but its troops, by a special convention made in 1866, are incorporated with those of the North German Confederation.

The strength of the forces of Bavaria, Würtemberg, and Baden, was as follows at the commencement of 1870:

	Peace Footing.	War Footing.
Bavaria . . .	56,760	92,500
Würtemberg .	14,158	34,405
Baden . . .	12,900	20,720
Total . .	83,818	147,625

The aggregate cost of maintaining the armed forces of the three states on the peace footing amounted in the year 1869 to 4,658,920*l.*, being at the rate of 55*l.* 12*s.* per head of soldier.

10. *Spain.*—The army of Spain was reorganised in 1868–69, the military institutions of France being taken as a model. Under the new law the whole of the male population is liable to conscription at the age of 20, an annual bill passed by the Cortes settling the number to be drawn by lot. The men so taken have to serve four years in the standing or permanent army, after which they are enrolled for four years longer in the first reserve, and, under certain circumstances, for an additional four years in the second, or Sedentary Reserve. Besides the regular army, Spain has three descriptions of irregular forces, known, respectively, as the "Provinciales," or county militia, the "Carabineros," armed customs officers and tax-gatherers, and the "Guardia Civil," or police soldiers. The strength of the whole of the armed forces of Spain is given as follows in the last official returns:

	Staff.	Officers.	Rank and File.
Regular army:			
Infantry	278	2,647	57,258
Artillery	44	369	9,486
Engineers	8	72	2,288
Cavalry	107	829	10,904
Irregular forces:			
Provinciales . . .	173	1,510	43,243
Carabineros	43	470	11,549
Guardia Civil . . .	24	401	9,965
Total . . .	677	6,298	144,693

The grand total here enumerated amounts to 151,668 men, the regular army contributing 82,290. A law passed by the Cortes in 1869 ordered the strength of the regular army to be 200,000 men under the new organisation, but it was admitted by the Government

that the state of the national finances would not allow the immediate execution of the legislative enactment.

The cost of the Spanish army was set down in the budget for the financial year ending June, 1869, at 3,966,712*l.*, which, leaving aside the irregular forces, would amount to an expenditure of 43*l.* 7*s.* per head, men and officers.

11. *Sweden.*—The constitution and organisation of the Swedish army differs from that of all others in Europe. It is modernised by conscription, but the basis of it is a sort of feudal militia, established by King Carl XI. in 1680, under the name of "Indelta." The Indelta is maintained, not by the general government, but by the landowners, and, to some extent, from the income of state domains expressly reserved for this purpose. Every soldier of the Indelta has, besides a small annual pay, his *torp*, or cottage, with a piece of ground attached, which remains his own during the whole period of service, often extending over forty years, or even longer. In time of peace, the troops of the Indelta are not called up for more than a month's annual practice, and for the rest of the year are free from military duty. The standing army of the kingdom is formed partly and mainly by conscription, introduced in 1812, and partly by voluntary enlistment, the two classes being kept separate, as "Beväring" and "Värfvade." The Beväring, or conscription troops, are drawn by annual levy from the male population between the age of 20 and 25 years, every one possessing the right of purchasing substitutes. About 19,000 men are drafted annually, one-tenth of which number, on the average, find substitutes for themselves, at a cost of from 10*l.* to 25*l.* Three-fourths of the conscription troops are generally on furlough. The Värfvade, or enlisted troops, form the corps of the royal lifeguards, the hussars, the engineers, and the artillery. The men may engage for either three, or six, or twelve years; but the greater number are for six years, peculiar inducements being held out for this term. Besides the troops here specified, the province of Gothland has an armed force of infantry organised similarly to the Indelta, but under separate command, established for purely defensive purposes, and not allowed to serve out of Gothland.

The following is a summary of the strength of the Swedish army, after the last returns:

	Men and Officers.
Indelta, or national militia . .	33,405
Beväring, or conscription troops	95,295
Värfvade, or enlisted troops . .	7,692
Militia of Gothland	7,921
Total	144,313

The expenditure for the Swedish army was given in the budget of 1869 as only 529,334*l.*, which, accounting for the per centage of conscription troops generally on furlough, and the separately maintained Indelta and militia of Gothland, leaves the average cost of the soldier at 16*l.* 16*s.* per head.

12. *Turkey.*—The system of conscription was first introduced into the Turkish dominions by Sultan Mahmoud II. in 1826, after the

insurrection and slaughter of the old imperial troops, the Janissaries; but it was only tentatively carried out till 1843, when it was finally established by law. Only those subjects of the sultan who profess the creed of Mahomet—less than one-half of the population—are subject to conscription, and the adherents of the Christian and of all other religions are exempt from it. The conscripts are drawn at the age of twenty years; the period of service in the standing army is limited to five years, and the annual contingent is about 25,000 men. But one son in a family can be taken as a conscript, and when there is but one he is exempted. Only a portion of the troops is raised by conscription, and the rest is procured by enlistment, which is productive of many recruits, as the pay in the Turkish army is high for the country, amounting to about 3*s.* 6*d.* per month, besides clothing and full rations. The government undertakes the task of procuring substitutes at a fixed price for all who wish to avoid the conscription.

As at present organised, the military forces of the Turkish empire comprise four descriptions of troops: namely, first, the "Nizam," or Standing Army; secondly, the "Redif," or Reserve; thirdly, the Auxiliaries, and fourthly, the Irregulars. The standing army, formed after the French model, and commanded by officers educated in France and Germany, is estimated—official reports wanting—to be of the following strength:

—	Regiments.	Peace Footing.	War Footing.
Infantry	36	100,800	117,360
Cavalry	24	17,280	22,416
Field artillery	6	7,800	7,800
Fortress artillery	4	5,200	5,200
Engineers	2	1,600	1,600
Detached corps in Candia	4	8,000	8,000
Detached corps in Tripoli	2	4,000	4,000
Detached corps in Tunis	2	4,000	4,000
Total	80	148,680	170,376

The second division of the Turkish forces, the Redif, or Reserve, is organised in the same manner as the Nizam, with staffs of commissioned and non-commissioned officers. All the latter are in active service, throughout the year, but the Redif soldiers only meet for four weeks annually, to take part in field manœuvres. The third division of the forces, the Auxiliaries, consists of the contingents of the tributary provinces of the empire, namely, Wallachia and Moldavia, Servia, Bosnia, the Herzegovina, Upper Albania, and Egypt. The actual number of these troops varies greatly at different periods, and depends on the politics of the time, or the enemy against whom they are expected to take the field. In the late war with Russia the number of Auxiliaries amounted to about 75,000 men, namely, 30,000 from Bosnia and the Herzegovina, 20,000 from Upper Albania, and 25,000 from Egypt. Lastly, the fourth division of the forces of Turkey, the Irregulars, are calculated to number a total of 87,000 men. They comprise police troops and county militia, to the number of 30,000; Tartars of Dobrodja and Asia Minor, 5,000; Hungarian,

Polish, and other volunteers, 2,000; and Moslem volunteers to the number of 50,000 men.

In the published finance accounts the cost of the Turkish army is stated to average 3,500,000*l.* per annum. The military expenditure for 1864 was set down at 3,725,059*l.*, and that for 1866 at 2,956,725*l.*, while in the war year 1854 it amounted, according to a report of the grand vizier, to 6,055,000*l.* Taking the mean expenditure of recent years, namely, three and a half millions sterling, and leaving out of account charges for the Reserve, Auxiliaries, and Irregulars, mostly covered, if at all, by special or local resources, the average annual cost is 23*l.* 12*s.* per head of the 148,680 soldiers represented to form the standing army of the Turkish empire.

National Armament.

1. *Denmark.*—The political necessities of Denmark, lowest in the list of population, next to Greece, of all the kingdoms of Europe, enforced, for years past, a vigilant look-out over military institutions. Voluntary enlistment and conscription combined brought a Danish army of 68,900 men into the field during the first Schleswig-Holstein war, but as even this strength, quite disproportionate to the population of the state, and utterly ruinous to its finances, failed in upholding territorial limits, it was decided to have recourse to national armament. A law of army reorganisation, passed by the Rigsdag, the Diet of Denmark, on the 6th of July, 1867, made all the men of the kingdom able to carry arms liable for military service at the completed age of 21. By the terms of the law the period of service is eight years in the regular or Active Army, with enrolment for eight years more in the army of Reserve. The drilling is divided into two periods; the first lasts six months for the infantry, five months for the field artillery and the engineers, nine months and two weeks for the cavalry, and four months for the siege artillery and the technic corps. The second period of drill, which is for only a portion of the recruits of each branch of arms, mainly those who have profited the least by the first course, lasts nine months for the infantry, eleven months for the cavalry, and one year for the artillery and the engineers. Besides, every corps has to drill each year during from thirty to forty-five days. It is provided by the law of 1867 that the kingdom shall be divided into five territorial brigades, and every brigade into four territorial battalions, in such a way that no district and no town, the capital excepted, will belong to more than one territorial battalion. Every territorial brigade furnishes the contingent of a brigade of infantry and one regiment of cavalry. The artillery contingent is furnished, one-half by the two first territorial brigades, and the second half by the three other divisions.

Under the law of general armament, as yet imperfectly carried out, leaning to some extent towards the old system of conscription, the forces of the kingdom comprise twenty battalions of infantry of the line, with ten depôt battalions and ten of reserve; five regiments of cavalry, each with two squadrons active and two depôt; and two regiments of artillery, in twelve batteries. About one-half the men

enrolled in the regular or Active Army are usually on furlough. The total strength of the army is returned officially as follows:

—	Active Army.	Reserves in Depôts.	Total.
Staff	51	10	61
Infantry . . .	32,203	6,536	38,739
Cavalry	2,992	889	3,881
Artillery . . .	5,379	2,497	7,876
Engineers . . .	1,089	165	1,254
Train	1,304	235	1,539
Total . .	43,018	10,332	53,350

The expenditure for the Danish army was given in the budget estimates for the financial year ending 31st of March, 1870, as 471,907*l.*, which represents the average annual cost per head of each soldier of the Active Army at only 10*l.* 16*s.*, or at 21*l.* 12*s.*, when allowing for the moiety of soldiers withdrawn generally by furlough from military service.

2. *Norway.*—The military institutions of Norway—differing, like the whole political and social organisation, entirely from those of Sweden, the union between the two countries being purely dynastic—were recast by a law which the Storthing, sovereign parliament of the realm, adopted on the 20th of April, 1866, and which came into operation on the 1st of January of the following year. Under this law, the basis of the armed forces of the country is the "Landvaern," or land defence, consisting of the total male population in arms. Every native of Norway who has reached the age of 18, and is able in body and untainted by crime, is bound to enter the Landvaern for three years, not permanently, however, but to be trained in arms at stated periods and to go through field-exercises. After quitting the Landvaern, the man has his name enrolled in the "Landstorm," the national levy, which can be called out only in time of war. It is expressly enacted by the law of 1866 that both the Landvaern and Landstorm shall only serve for the defence of the country, and never take part in an aggressive war. Besides the forces of the national armament, Norway has a small standing army, raised partly by conscription and partly by voluntary enlistment. The latter is resorted to in the first instance, and only if insufficient the law empowers conscription, to which all young men at the age of 19 are liable. The term of service in the standing army is seven years for those procured by voluntary enlistment, but the men raised by conscription have but to go through a system of military training extending over not less than forty-two days in the first year, and this past, they are sent home on furlough, under obligation to meet for an annual practice of twenty-four days during the following six years. It is enacted by the law of 1868 that the number of enlisted and conscription troops shall never be more than 12,000 in time of peace, and that in war it shall not be increased above 18,000 men without the special consent of the Storthing. Except for common military exercises, strictly limited in time and number of men, no soldier of

Norway is allowed to go to Sweden, nor are Swedish soldiers allowed to set foot in Norway.

The nominal strength of the various divisions of the armed forces of Norway is as follows according to the last returns:

	Peace Footing.	War Footing.
Infantry . .	41,061	98,500
Cavalry . . .	1,164	5,100
Artillery . .	5,348	7,350
Engineers . .	141	1,275
Total . .	47,714	112,225

The actual number of troops kept under arms, and maintained by the state, is not generally above 6000 men, representing mainly, if not entirely, the soldiers raised by voluntary enlistment.

The annual expenditure for the Norwegian army during the last financial period, commencing April, 1866, and ending March, 1869, amounted to 220,523*l.* Taking the number of troops actually under arms during the time at the average of 6000, this gives 36*l.* 15*s.* per head as the cost of the Norwegian soldier of the standing army.

3. *Prussia and North German Confederation.*—The national armament of Prussia sprang out of the direst political misfortunes of the country. Prussia arose in the world and made itself a name as a military state. But the troops with which King Frederick II. gained victories against overwhelming Austrian, French, and Russian armies, were procured by enlistment, not always voluntary, and the system broke down completely when confronted with the superior one of raising soldiers by conscription, resorted to by the French Republic. Deeply humiliated after the disaster of Jena, Prussia had to bind itself at the peace of Tilsit not to keep more than 42,000 men under arms: an engagement equal to its extinction as a military power. To remedy this fatal state of things, a grand and yet simple expedient was hit upon by one of the ablest strategists of Prussia, General von Scharnhorst, chief of the staff of the king. Strictly adhering to the engagement of only maintaining an army of 42,000 men, Scharnhorst made well organised arrangements for renewing this number constantly, not keeping the men a day longer under arms than necessary to give them a good military training, and then sending them home again, to be replaced by fresh recruits. It was certain that by this method, acted upon with no less energy than discretion, all the inhabitants of the kingdom, restricted by Napoleon within narrow boundaries, would have to become trained soldiers in course of time. The system was not that at present existing, but its indispensable forerunner. Among the people of Prussia, particularly the middle classes, there was at first little love for the far-reaching scheme of the chief of the staff, which obtained the name of the "Krümper-system," the files of big-boned peasants everlastingly passing through Scharnhorst's military mill being known as "Krümper," a term designating raw recruits. But the "*cruities*" nevertheless came out grand in 1813, when, Scharnhorst's mill having been at work for about five years, they drove Napoleon's hosts from the soil of Germany. It was

acknowledged now on all hands that, though conscription beat enlistment in the art of war, there was something above conscription.

The "Krümper-system" lived from 1808 to 1813, and then shaped itself with little effort into a system of general armament, through a "Landwehr," or land defence, henceforth the key of the military institutions of Prussia. The "Landwehr-system" was inaugurated by a royal decree of the 21st of November, 1815, followed by others next year, which laid the basis of the military organisation still in force, very little modified to the present time, except as to the terms of service in the various divisions of the army, which were altered in several instances, notably within the last few years. As a main principle, the law enacts that every man not disabled by health, or want of physical strength, shall receive military instruction and enter the army for a certain number of years. There are, practically, some exceptions from military service, though no substitution whatever is allowed. Every Prussian subject is enrolled as a soldier as soon as he has completed his twentieth year. He has to be in service during seven years, of which three years, from twenty to twenty-three, must be spent in the regular army, and the remaining four years, from twenty-three to twenty-seven, in the army of reserve. At the end of this term the soldier enters the "Landwehr" for nine years, with liability to be called upon for annual practice, and to be incorporated in the regular army in time of war. Leaving the "Landwehr," the soldier is finally enrolled, till the age of fifty, in the "Landsturm," which body is only called upon for service within the frontiers of the country, in case of invasion. There are various exemptions from this law of military service, in favour of the nobility, clergy, and some other classes of the population. A certain amount of education and fortune constitutes also a partial exemption, inasmuch as young men of twenty, who pay for their own equipment and can pass a light examination, have to serve only one year in the regular army, instead of three. But in this case, the liability to service in the "Landwehr" and the "Landsturm" remains the same. Altogether, setting aside a few exceptions, the whole male population of Prussia may be said to be trained for arms, and ready for offensive warfare, either in the army or the "Landwehr," from the age of twenty to that of thirty-six, and for defensive warfare, within the country, till the age of fifty years, which brings the final discharge from military service.

The mass of soldiers raised in Prussia by means of the system of general armament is divided into companies, battalions, regiments, and *corps d'armée*. The strength of a battalion in peace is 518 men, raised in war to 1002 by calling in part of the reserves; it is divided into four companies, each of which in war consists of 250 men. During peace each regiment of infantry consists of three battalions, each brigade of two regiments, and each infantry division of two brigades, to which, under the command of the divisional general, four squadrons of cavalry, four batteries of artillery, each of six guns, and either a battalion of riflemen, or a battalion of pioneers are attached. The *corps d'armée* is considered a unit which is independent in itself, and includes not only troops of all three arms, but a portion of all the stores and appliances which are required by a whole army. Each

corps d'armée consists of two divisions of infantry, a cavalry division of four regiments, with two horse artillery batteries attached, besides the two cavalry regiments attached to the infantry divisions, and a reserve of artillery of four field batteries and two mounted batteries. The *corps d'armée* are locally distributed through the monarchy.

The strength of the armed forces of Prussia was reported as follows at the commencement of 1870:

—	Officers.	Rank and File.	Total.
Infantry of the line	6,697	188,943	195,640
Riflemen, or Jäger	352	8,480	8,832
Infantry of the Landwehr	431	3,512	3,943
Cavalry	1,898	52,786	54,684
Artillery	1,672	31,854	33,526
Engineers	234	6,489	6,723
Military Train	156	2,925	3,081
Administrative and other troops	1,484	4,715	6,199
Total	12,924	299,704	312,628

The numbers given in the preceding table represent the peace footing of the Prussian army. The war-footing, effected by calling in the reserves, which can be accomplished in from twelve to fourteen days, brings the strength of the army up to 700,000 men.

The Prussian system of general armament was adopted in 1867 by all the states of the North German Confederation, it being made a clause of the Charter of Union that "every native of the Confederation is liable to military service, and no substitution allowed." The strength of the Federal army on the peace-footing was settled upon the basis of one per cent. of the population, and the Prussian military organization was applied to all the states of the Confederation. All the troops of the Confederation form one army, under the command of the King of Prussia, of the following strength:

—	Peace Footing.	War Footing.
Field troops, privates and non-commissioned officers	287,481	511,826
Depôts of regiments	..	180,672
Garrison troops	13,046	265,082
Officers, staff, and military schools	18,831	19,682
Total	319,358	977,262

The army expenditure of the North German Confederation was settled by the Charter of Union on the basis that the sum of 225 thalers, or 33*l.* 15*s.*, is to be allowed for every soldier on active service. The amount is defrayed out of the customs receipts, and should these prove insufficient, the total must be made up by a special tax, falling upon the various states in proportion to the rate of population. In the year 1869 the Federal army expenditure was 9,951,041*l.*, and in the budget estimates for 1870 it was calculated at 10,192,626*l.* Thus,

the number of soldiers on active service was 294,445 in 1869, and was estimated at 302,004 for 1870, on the cost calculation of 33*l.* 15*s.* per head.

4. *Switzerland.*—The military history of Switzerland resembles, in many respects, that of Prussia. Although famous for its fighting men, hired by half the kings of Europe as the perfection of soldiers, the enlisted troops of warlike Switzerland were no more able than the enlisted battalions of conquering Prussia to withstand the shock of conscription-drawn citizens in arms, and the French came to conquer the mountain fastnesses between Jura and Alps with as much ease as they did the wide plains between the Lower Rhine and the Baltic. It was as early seen by Swiss as it was by Prussian statesmen that to secure national independence recourse must be had to other means than hired soldiers; but the constitution of the small and somewhat helpless confederacy of Alpine states, composed of citizens differing in race and religion, and long distracted by internal feuds, made a remedy no easy matter, and it was only in recent years that the same system which made the people of the Hohenzollern kingdom a nation in arms could be applied, in a manner necessitated by circumstances, to the Helvetian Republic. Many preparations tending towards national armament were made in Switzerland since the days of the French occupation; but the system was not fully introduced until the year 1848, when the old "Staaten-bund," or league of cantons, was converted into a "Bundes-staat," or united Confederacy.

The system of national armament now in force in Switzerland was constituted by the law of military organization of the 8th of May, 1850, based upon the 13th article of the Constitution of September 12, 1848, which forbids the maintenance of a standing army within the limits of the Confederation. To provide for the defence of the country every citizen has to bear arms, in the management of which the children are instructed at school, from the age of 8, passing through annual exercises and reviews, which, though voluntary, are participated in by nearly all the pupils of the upper and middle-class, and many of the elementary schools. The actual liability to arms begins with the completed twentieth year, at which age every native, not disabled by health, must enter his name for military service, and is placed on the rolls of the "Bundesauszug," the general Federal army, on which he remains till the completed thirty-second year, when he is transferred to the Army of Reserve till the age of 40, passing from thence to the "Landwehr" till 45, and, finally, to the "Landsturm" until death. As soon as placed on the rolls of the "Bundesauszug," the recruit has to undergo a training of from 28 to 35 days, according to his entering the ranks of either the infantry, the "Scharfschützen," or picked riflemen, the cavalry, or the artillery. Both the men of the "Bundesauszug" and the reserve are called together in their respective cantons for annual exercises, extending over a week for the infantry, and over two weeks for the cavalry and artillery, while periodically, once or twice a year, the troops of a number of cantons are brought together for a general muster. By the terms of the law of 1850, all cantons are obliged to furnish at least three per cent. of their population to the "Bundes-

auszug," one and a half per cent. to the Army of Reserve, and two per cent. to the "Landwehr." The actual strength of the forces under arms in 1869 was officially returned as follows:

	Men.
Bundesauszug . . .	85,138
Army of reserve . .	50,559
Landwehr	64,323
Total . . .	200,020

The number belonging to the fourth class of Federal forces, the "Landsturm," was estimated by the Government, in 1869, at 150,000 men.

The military instruction of the Swiss Federal army is given to officers not permanently appointed or paid, but who must have undergone a course of education and passed an examination at one of the training establishments. The centre of these is the Military Academy at Thun, near Bern, maintained by the Federal government, and which supplies the army both with the highest class of officers, and with teachers to instruct the lower grades. Besides this academy, there are special training schools for the various branches of the service, especially the artillery and the "Scharfschützen." The nomination of the officers up to the rank of captain is made by the cantonal governments, and above that rank by the Federal Council. At the head of the whole military organisation is a general commanding-in-chief, appointed, together with the chief of the staff of the army, by the Federal Assembly.

The total expenditure on account of the army of Switzerland was 2,384,347 francs, or 95,374*l.* in 1867, and 2,442,011 francs, or 96,319*l.*, in 1868. The expenses in the year 1868 were distributed as follows:

	Francs.	£
Central military administration	119,716	4,788
Organization of instruction	165,332	6,613
Pay of army instructors of all branches . . .	1,756,231	70,249
War material	155,210	6,208
Frontier guards and fortifications	17,860	714
Office of general commanding-in-chief and staff .	37,347	1,494
Construction of barracks	140,447	5,614
Printing and advertising	33,975	1,359
Miscellaneous expenses	7,003	280
Total	2,442,011	97,319

It will be seen that under the military system introduced in Switzerland, excluding a standing army, and designed purely for defensive purposes, an armed force of 200,020 men was maintained at an annual cost of 9*s.* 6*d.* per head.

The above sketch of the formation, organisation, strength, and cost of the armed forces of Europe has no other aim than to supply a few memoranda. Others may draw conclusions.

FREDERICK MARTIN.

PART II.

ARCHITECTURE AND PUBLIC IMPROVEMENTS, LEGISLATION, STATISTICS, AND CHRONICLE OF 1869-70.

ARCHITECTURE AND PUBLIC IMPROVEMENTS.

1. General Progress:—Art and Public Monuments.

Eighteen hundred and seventy will be a year famous in history: but not for architectural achievements. During the first half of the year the protracted commercial depression affected building as it did all other extensive operations: in the latter half men have cared for little but the incidents and consequences of this horrible war. Structures that were begun have for the most part been carried forward, but not always with remarkable energy. Some important works have been completed, but not many have been commenced.

In the character of the buildings little novelty is observable. The works that have been finished, and those still on hand, present the usual and almost unintelligible diversities. Style and character seem, as of old, to be but too generally determined with little, if any, consideration for the site the building is to occupy or the exact purpose it is intended to fulfil. So that a church be Gothic of the fashionable type, and up to the latest ecclesiological standard; or a town-hall, bank, or pile of offices, have a sufficient display of polished granite shafts and plenty of carving, however coarse, it will pass without rebuke, whether it be placed in an open square, a broad street, or a dark and narrow lane.

However, on the whole, we are improving. There is more evidence of feeling, of study, of research, of a recognition of the truth that appropriateness to place and purpose is the primary and most essential quality in a building. What we chiefly lack is original thought, self-reliant energy, a clear appreciation of the end to be obtained, and a straightforward application of the means to obtain it. Imitative architecture, whether it be the copying of a particular building, or the reproduction and joining together of the parts of many buildings, or even working in the manner of some particular century and country, has lasted long enough. Men ought to know what their predecessors have done, and turn the knowledge to account for their own improvement; but they should work in their own way, express their thoughts in their own language, and with reference to their own, and not to any past, time, circumstances, and requirements.

But we have at present neither space nor inclination to pursue these general remarks, and will turn at once to our record of recent progress. When we last wrote the future of the new Law Courts was undetermined. The Chancellor of the Exchequer had pronounced in favour of abandoning the site which had cost so much

money, and put an entire neighbourhood to the rout, and proposed to erect an edifice of a smaller size and different character on an altogether new site by the Thames Embankment. Further consideration and discussion in and out of Parliament resulted, however, in a return to the original site, and a resolution to proceed with the works without longer delay. But Mr. Street has been called upon to modify his plan, or rather to make a radical change in it, and the new building, whilst smaller in scale than that originally proposed, will yet, it is said, afford within it ample accommodation for the several departments, and be found to be better adjusted to the ground. The new plan appears, on a careful examination, to be well considered, and the parts judiciously arranged. Of the elevation we as yet know nothing certain. That it will be Gothic, and of the general character of that in Mr. Street's first design, we may fairly assume; but we may hope that many of the original features will be materially modified under the thorough revision which has been forced upon the architect. Up to the present time the expenditure has been somewhat over 900,000*l.*, chiefly in the purchase of the ground and compensation to the owners and occupants of the houses removed. It was originally contemplated that "the whole undertaking would be completed for 1,500,000*l.*," but as the ideas of architect and commissioners expanded, the estimate rose to 3,200,000*l.*: it is now intended to bring the expenditure as near as possible to the sum originally sanctioned by Parliament. If this can be accomplished no one will complain, so that the building do not suffer. But it would be a mistaken economy that would incur risk of that. Far better another half million be added than that the national character should be damaged. It is a noble opportunity, and should be nobly used.

With the other great national work, the Government Offices, little visible progress has been made. Mr. Scott is understood to have been required to amend his designs for the Home and Colonial Offices, but the substructure is rising, and doubtless the building will now be steadily carried forward to completion. Further purchases have been made of houses and land in the vicinity of the Government Offices and the Houses of Parliament, and much of the north side of Bridge Street has been pulled down, but the extent to which the much-needed improvements will be carried is at present far from clear.

Even less clear is the actual position of affairs with reference to the proposed alterations in the Houses of Parliament. Those actually commenced will probably be completed, though the architect's designs may be modified. The present Commissioner of Works has a superb disdain for "architects and market-gardeners." He thanks the gods he knows nothing of art himself, and distrusts the sanity of those who do. The architectural advisers of the government (Mr. Fergusson and Mr. Pennethorne) have been got rid of. Mr. Barry has been dismissed with scant courtesy from his post as architect of the Houses of Parliament, and his larger schemes, although approved by committees of both Houses, will probably fall to the ground. The works begun will, we suppose, be continued without the encumbrance of professional supervision. As far as we can understand the Commissioner's statements, the only new works of any consequence that are

to be undertaken at present are a re-arrangement of the refreshment departments and the erection of a committee-room for the House of Lords, and in these Mr. Barry's plans will be followed as far as they agree with the views of the Office and the Commissioner.

Mr. Barry is retained conditionally as architect of the National Gallery, and a vote of 37,000*l.* was taken for the purchase of the additional site, but nothing is determined, and for awhile at least we may hope that nothing will be determined, about commencing the new building.

The structure which, amongst the national buildings, is making the most rapid progress is the new Post Office. This vast pile will be of about the same length and equal in size to the present Post Office, opposite which it will range. The St. Martin's-le-Grand front will be 286 feet long, that facing Newgate Street 144 feet, the height will be 84 feet. The building will be in four storeys, divided horizontally into two nearly equal portions. The lower half will comprise two storeys, rusticated, with engaged square shafts between the windows; the upper half will have pillars, with Roman Corinthian capitals in the centre and at the ends; above will be an attic with balustrade. The chief feature of the principal front will be a prostyle portico of two storeys, corresponding in character with the rest of the façade, the lower part being rusticated, the upper having Roman Corinthian columns supporting a pediment in which are to be the royal arms. As will be seen there is nothing very artistical or very original in the design, but its mass will render it imposing, and it will no doubt be arranged with due regard to convenience. It will be constructed of Portland stone on a basement of Cornish granite. The great feature of the interior will be the room on the ground floor devoted to money-order, savings-bank, registered letter, and telegraph offices, which will be 79 feet long, 52 wide, and 34 feet high. The designs were made by Mr. J. Williams, of the Board of Works.

Some further progress has been made with the Record Office, and the structure is now beginning to show the magnitude of its proportions. It plainly deserves a better site: we have not, however, yet learned to display our buildings to advantage. In our last volume we gave an engraving and description of the University of London. Since then the new building has been completed, and formally opened by the Queen. The front, on the hoarding being removed, fully sustained the commendation we bestowed upon it, and has met with general admiration: the only drawback, indeed, is the position, the narrowness of the street, with the deficiency of sunlight, preventing its being seen as an effective whole. The lecture hall, or theatre, the examination halls, and the great staircase, with their quiet and thoroughly architectural decoration, are worthy of the exterior, and do credit to the taste of the architect, Mr. Pennethorne, who, it is announced, is about to have the honour of knighthood conferred upon him.

The works at the South Kensington Museum are making satisfactory progress, but the building as a whole is still far from displaying its true proportions and distinctive character. There is much to admire in the careful arrangement of the decorative features and the various details, but at present we fail to discern that breadth, sim-

plicity, and grandeur which stamp on a building the presiding genius of a great architect. Looking at it as it now appears, one fears that when completed it will bear too much the aspect of a repetition of little members, pretty enough in themselves, but wanting the unity and dignity required in an edifice of such magnitude and pretension. The interior decoration is sufficiently splendid, and is almost obtrusively suggestive of the purpose of the building as a museum of ornamental art. Much of it is certainly in questionable taste, but it is perhaps proper to regard it as experimental. The Museum has become an almost inexhaustible repository of industrial art.

It seems to be settled, as far as such matters can be considered settled in these days of fluctuating counsels, that a new Natural History Museum is to be erected on the site of the Exhibition building of 1862, to which the natural history collections now in the British Museum are to be removed. The museum is to occupy an area of at least four acres, and room is to be reserved for wings; the estimated cost is 350,000*l.*, but at present a vote has been taken merely for clearing the ground. The character of the building has probably not been decided, but it is officially announced that "the arrangement of the collections will be typical." It is to be regretted that it should be necessary to remove the collections to a locality so inconvenient for the bulk of the inhabitants of London, but there would have been great difficulty in obtaining an equal space in a more convenient locality, while here there is ample room for the largest collection we are likely to possess: we may trust that no niggardly provision will be made for its future extension. With our Indian empire, colonial possessions, and maritime relations, we ought to obtain a museum of natural history comprehensive beyond the possibility of rivalry.

Sufficient progress has been made with the new buildings bordering the Horticultural Society's Garden to leave no doubt that they will be ready for the first Annual International Exhibition to be held in 1871—if, indeed, the state of the Continent renders it practicable or desirable to hold such an exhibition then. The buildings, however, make little claim to architectural character; they are for use: beauty must be looked for within them. They consist of two floors of five rooms in each, extending along both sides of the Horticultural Society's Garden, the upper floor being the principal. The rooms are narrow, with coved ceilings, and skylights; are painted of a sea-green colour; and are light and cheerful, but quite unpretending in character.

The vast structure immediately north of them has no such retiring modesty. The Royal Albert Hall of Arts and Sciences claims to be unique among the buildings of England, alike as to size, purpose, the vast span of its roof, and the character of its external ornamentation. Its purpose and dimensions were stated in previous volumes, and may have to be referred to when we are able to speak of it as a completed edifice. At present its huge bulk, unusual shape, and cramped site are what most strike the eye. The walls are of a deep-red brick, the dressings and decorations of terra-cotta. The free employment of terra-cotta, and the frieze—a flat monochrome inlay, representing the peaceful triumphs of art and science, designed by Messrs. H. W.

Pickersgill, R.A., E. Armitage, A.R.A., E. J. Poynter, A.R.A., and H. S. Marks—promises to be effective. The interior is at present too much encumbered with scaffolding to be properly seen; but even now its vast proportions and its oval form render it very striking. The inner roof is not yet placed; the boxes are only, as it were, blocked out, and the enormous double orchestra is incomplete, and of course the ornamentation is untouched; but chaotic as it now appears, it is expected to be ready by May next. The building is inconveniently close to the road, and set at an awkward angle to it, but it is understood to have been so placed with a view to diverting the road here, and borrowing a slip from Hyde Park. The bill empowering this to be done was, however, thrown out of the House of Commons last session, though a Government measure. The members were indignant that a large slice of Hyde Park (including a row of fifty fine elms) should be so coolly appropriated; but they will have to yield. It is clear that this building and the Albert Memorial require the sacrifice. South Kensington is persistent, and sooner or later the thing will be done.

The Albert Memorial advances steadily. The whole of the structural part is completed; the surface decoration is for the most part executed; many of the statues and rilievi are in their places, and the lofty tabernacle glitters in the bright autumnal sun as though it were the work of some mediæval magician, whose wand transformed whatever it touched into gold. Gilding has never before, as far as we know, been used so lavishly on the exterior of a Gothic building. As the lofty canopy rises now above the surrounding sheds and hoarding, the effect is far from satisfactory. Despite of himself, the spectator is reminded of the stall of gilt gingerbread in a country fair. For the sake of the structure it were to be wished it could have been concealed till shown at once and complete. Its majestic proportions and consistent splendour would then perhaps have shielded it from unpleasant associations. It will be finished, the architect expects, in the spring of 1871. The model of Mr. Foley's statue of the Prince Consort has been tried in its proper position and approved; but it hardly seems probable that this statue and all the other artistic decoration will be ready by the time named.

For some years past we have had to refer to the protracted delay in completing the Wellington Memorial, for the erection of which, in St. Paul's Cathedral, the House of Commons, shortly after the Duke's death, voted a sum of 20,000*l*. Recently, some progress was made in erecting the architectural portion of the memorial; but the works were suddenly arrested. As the result of an inquiry, ordered by the government, it appears that of the 14,000*l*. which the sculptor was to have been paid for his share of the work, he has received over 13,000*l*., but that, though the full-sized model of the whole design is completed, "the purely sculptor's work—consisting of the sarcophagus, the recumbent figure, the subordinate groups, trophies, and the crowning feature on the top, all of which are intended to be of bronze-metal—is not yet commenced, excepting only some of the requisite modelling. The estimated expenditure for the bronze castings and for fixing them is 10,000*l*." Altogether of the 20,000*l*.

voted, nearly 18,000*l.* have been expended, and it is estimated that 15,000*l.* more will be required to complete the work. Such was the incomplete state of the monument, according to the First Commissioner of Works, that no hope could be entertained of its being finished within any reasonable period, and he therefore determined the contract with Mr. Stevens, and intimated to Mr. Penrose, as the "consulting and certifying architect," that an "inquiry would be made into the exact nature of his liabilities, in consequence of the certificates he had given." That the government, sculptor, and architect should go into a law court would be pitiable. Full, and it is to be desired sufficient, explanations are promised, and no doubt will eventually be given: meanwhile, the memorial is at a standstill, and comment would be out of place.

Other memorials need not detain us long. A bronze equestrian statue of the Queen has been erected in front of St. George's Hall, Liverpool, as a companion to the statue of the Prince Consort, erected on the corresponding site a few years back. Her Majesty is represented in a riding-habit, and wears the ribbon of the Garter across her breast. The statue, which was designed by Mr. Thorneycroft, is 14 feet high, and stands on a granite pedestal. It cost 5000*l.*

Liverpool has also erected a statue to Mr. Gladstone. This is of marble, the work of Mr. J. Adams-Acton, and is placed in St. George's Hall, in a niche corresponding to one in which is a statue of the late Earl of Derby. Mr. Gladstone is clad in the official robes of a Chancellor of the Exchequer, has his right hand against his breast, in his left the ever-recurring roll of paper: the likeness is considered to be good. A marble statue of Lord Palmerston has been erected by his grave in Westminster Abbey. The statue is a fairly good one; the position is natural, and the likeness satisfactory; but it looks sadly out of keeping to see a man like Lord Palmerston tricked out in the tawdry costume of a Knight of the Garter, and then, over against him, on the other side of the church, his old compatriot, Sir Robert Peel, masquerading in a Roman toga; the statues, we may suppose, being intended to convey to posterity the true appearance of these associated statesmen. We have certainly something yet to learn respecting the proper mode of treating memorial statues of the men we seek to honour.

A statue of the late Earl of Carlisle has been erected by the people of Cumberland on Brampton Moor, nine miles from Carlisle. It is of bronze, about 8 feet high, and stands on a stone pedestal of the same height. The Earl is in the robes of the Order of the Garter, and the statue is in effect a duplicate of that executed by the same sculptor, Mr. J. H. Foley, R.A., for Phœnix Park, Dublin. The statue of Sir Rowland Hill, by Mr. Peter Hollins, has been erected in the Exchange, Birmingham. The likeness is considered to be characteristic, and altogether the statue is much admired. Sir Rowland and the sculptor are both natives of Birmingham, and in raising this statue their townsmen seek to honour them both. Some other memorials have been erected, but, as far as we know, none of any value as works of art, while some, like the memorial of Daniel Defoe, in Bunhill Fields, are almost puerile.

2. Public and Sanitary Works.

The Thames Embankment, or, as it is officially named, the Victoria Embankment, the grand achievement of the Metropolitan Board of Works, was formally opened in July last, by the Prince of Wales, as the representative of the Queen. The honour was none too great. No work of our time has done half as much for the embellishment of London. It has been long on hand, but, as far as it has been finished, the work has been done well. As far as it is finished—for, though the constructional part of the embankment is completed, the approaches and the extension, to say nothing of the ornamental features, are far from being finished. The embankment forms an unrivalled public way between Westminster and Blackfriars Bridges; but the continuation eastwards to the Mansion House will not be opened for months to come. The passage has been continued through Whitehall Place to the embankment, but the approaches from Villiers Street, and east of Somerset House, which would serve to divert a portion of the traffic from the overcrowded Strand and Fleet Street, exist only on paper; and the reclaimed ground along the roadway remains an unsightly waste. The embankment itself is a magnificent work. A hundred feet wide, and following the easy curve of the river, with the Houses of Parliament at one end, and St. Paul's at the other, Waterloo Bridge and Somerset House midway, and all along the wide and always animated Thames, no capital can show, and none could desire, a finer or more characteristic roadway through its midst. On the use that is made of the waste ground beside it will, however, very much depend the ultimate aspect and character of the way. It cannot be wholly spoiled, but it may be very much injured. How much mean and insignificant buildings may disfigure it, may be seen by observing the effect of the trumpery stations of the Metropolitan District Railway: how far the proximity of unsightly forms and noisome smells may destroy the pleasure of a stroll or ride along the embankment is shown by the gasworks at its eastern end. There has been some talk of erecting government offices on some part of it, and deputations have gone to the ministers to protest against this being done, and a resolution condemning it has passed the Commons. It appears to be the popular desire to lay out a large part of the unappropriated ground as public gardens. This would, doubtless, be a very pleasant way of occupying the site, and a portion of it might very well be so occupied, but nothing would contribute so much to the grandeur of the way as placing along it a number of stately edifices. They should not be close together, and they need not be numerous; but they should be worthy of the site, and they should be devoted to the public service. How vastly better, for example, would the National Portrait Gallery, or any other popular museum, be here than away at South Kensington; or, what better site could be found for a free library and public reading-room, on a scale worthy of the metropolis of England? We were told of statues that were to be ranged along the roadway, of sculptured groups that were to adorn the landing places—where are they? The new street, Queen Victoria Street, as it has been officially named, which is to continue the Thames

Embankment to the Mansion House has been opened no farther than when we wrote last year.

The Southern, or Albert, Embankment is completed. The long range of buildings forming St. Thomas's Hospital nobly occupies the land side—it is unfortunate there was not room to set them a few yards farther back—and parallel with them on the opposite side of the river extends the long front of the Houses of Parliament. So far, the Southern is happier in its *entourage* than the Northern Embankment, but it terminates abruptly among gas and chemical works, and potteries, and other smoky and unodoriferous "industrial establishments," with which that part of Lambeth abounds. This Southern Embankment has cost about 1,100,000*l.*; the Northern Embankment nearly 2,000,000*l.* The embankment at Chelsea is at length to be proceeded with; it is to be about a mile long; is to carry with it the main sewer; will be faced with mill-stone grit towards the river, and is estimated to cost about 250,000*l.*

A valuable improvement, which has been some time on hand, the new street from Whitechapel High Street to the Commercial Road, was this year completed by the Metropolitan Board of Works. It opens a broad thoroughfare from the City to the East and West India Docks and Blackwall, avoiding the narrow and angular passage by Whitechapel Church. Though only 400 yards long, it has cost nearly 250,000*l.*, chiefly owing to the purchase of property, and compensation to the tenants of the houses pulled down. A still more important improvement—the construction of a direct route from north to south, from Tottenham Court Road to Charing Cross, urgently demands the attention of the Board; and a second route is almost as much needed from the Strand, by Wellington Street, or the New Law Courts, to Holborn.

The great City improvement, the Holborn Viaduct, was opened by the Queen about the time of the publication of the 'Companion' for 1870; but as this was anticipated in that volume, and the viaduct described at some length, it is necessary to do little more than mention its inauguration. The magnitude of the work may be judged by its cost, which considerably exceeds two millions; but the elaborate character of the construction, and the engineering skill expended upon it, could be appreciated only by careful inspection. The great ornamental feature of the viaduct, the bridge across Farringdon Street, is a striking and picturesque structure. Objections may, indeed, be made to some of the artistic details, but beyond dispute it is much the finest bridge of the kind we possess. A good deal of surprise, and some anxiety, was caused by the appearance of cracks in some of the great polished granite columns soon after the opening of the bridge, but they have borne the heavy traffic, and all the changes of temperature, of the past year, without any perceptible extension of the flaws, and the safety of the work is no longer, if it ever was seriously, in doubt. The ornamental buildings at the four corners of the bridge, in which are staircases connecting the viaduct with the street below, contribute greatly to the effect of the bridge, but they do not seem to be well-placed or conveniently arranged for commercial use, as neither of them has been let. Indeed, the extent of ground along the viaduct,

with the "surplus land" in its vicinity, remaining void, is somewhat surprising, and shows a strange want of enterprise on the part of the public, or misapprehension of its value by the civic authorities. A good deal of surplus land is also lying waste in the neighbourhood of the New Meat Market. This market, with the ground about it, has cost the City nearly 700,000*l*., whilst Western Approach Street has cost nearly 300,000*l*., and as yet the surplus land has been suffered to remain unoccupied and unproductive; it is now, however, proposed to utilise a portion of it by the erection of a new Poultry Market on the south side of Charterhouse Street.

It is hardly necessary to continue longer in detail our record of railway extension. The railway system of the country is, in its broad features, tolerably developed. If any important additions are made, it will probably not be for some time to come. Short extensions, connecting links, and the like, are constructed, but no great schemes are initiated, nor are they, perhaps, likely to be in the present state of commercial feeling. During the past year nearly the same additional length of railway was completed as in the previous year. The latest returns showed that at the end of October 1870, 13,824 miles of railway were in operation, being an increase of 156 miles since the corresponding week of 1869. In 1869 the increase was 166 miles. Of the London lines the principal extension was that of the Metropolitan District Railway from Westminster, along the Thames Embankment, to Blackfriars. The extension eastward is being pushed forward to Cannon Street, where for the present it will stop, the company having failed in their application to Parliament to make the Mansion House their terminus. The East London Railway has been completed through the Thames Tunnel, but at present it stops at Wapping; its heaviest works, under the London Docks, have yet to be accomplished. It will eventually be continued to the new terminus of the Great Eastern Railway, Liverpool Street, Bishopsgate. For this terminus an immense space has been cleared, and report says that the building will be one of the most magnificent yet constructed, but in the actual condition of the company's finances this appears at least questionable. The grand front of the Midland Terminus, at St. Pancras, is fast rising, and may be expected to go far towards determining the adaptation of Gothic to this class of buildings; the main part of the building, the reader hardly needs to be reminded, will be a first-class hotel; the architect is Mr. G. G. Scott, R.A.

The tramways which have been laid down in the Kennington Road, and between Whitechapel and Bow, appear to have been as successful as those tried in Liverpool and elsewhere, and Acts have been obtained for several new lines in London or its vicinity. Notices have been served that the roads will be immediately broken up for the extension of the Kennington line to Brixton Church in one direction, and to Westminster in the other, and for the formation of a new line from Holloway, through Camden Town and the Hampstead Road, to Tottenham Court Road. How they will answer in the crowded and narrow streets of London remains, however, to be tried. The Tower Subway, which passes under the Thames from Tower Hill to Tooley Street, and the remarkable construction of

which was described last year, has been opened for traffic, though, owing to some mechanical difficulties, it has not been kept open continuously. It is now, however, again in operation, but some better passenger arrangements must be made before it can be satisfactory either to the public or the shareholders: the present arrangements are simply disgraceful. The passage through the subway is made quickly and easily.

Another of the parks with which the people of Liverpool are encircling their city has been opened. Stanley Park is not so large as some of the others, having an area of only about 100 acres, but it occupies an elevated site on the north of the city, and commands a wide prospect over South Lancashire and Cheshire, beyond which, in clear weather, the sea-coast and the mountains of North Wales to Snowdon are visible, and on the other hand the Cumberland Mountains, the North Yorkshire Hills, and the Peak of Derbyshire. The ground has been well laid out by Mr. Kemp of Birkenhead; there are ample lawns, gardens, and shrubberies, playgrounds, good drives, and picturesque and serviceable buildings—altogether, a park that does honour to the Corporation, and must be a source of incalculable health and pleasure to the population of a town like Liverpool. The total cost has been about 120,000*l.*; the laying out of the ground cost about 42,000*l.* Manchester has also obtained an additional park. This, which is named Alexandra Park, comprises about 60 acres. It has been very prettily laid out by Mr. G. A. Hennell, the lodges and other buildings being designed by Mr. A. Darbishire. Its chief ornamental features are a grand terrace and sumptuous rosaries; but it has besides, for the various classes of visitors, carriage-drives, rides, cricket-grounds, and separate gymnasia for the lasses and lads. It is the work of the Corporation, and cost about 60,000*l.* It lies south-west of the city, so as to serve for the townships of Hulme and Chorlton-on-Medlock, which together contain 150,000 inhabitants. Manningham Park, a finely timbered estate of 54 acres, has been purchased, through the liberality of the owner, Mr. S. C. Lister, on easy terms, by the Corporation of Bradford, to be appropriated for ever as a public park, for the use of the inhabitants of Bradford. When corporations are thus found catering with a liberal hand for the public health and enjoyment, it must be regarded as a sign of real progress, and it is pleasant to see that it is not only the corporations of these vast and wealthy manufacturing and commercial cities that are thus acting. The Corporation of Rochester has just obtained a long lease of Rochester Castle and grounds, and propose to spend 2000*l.* in laying out the latter as public gardens.

Whilst, however, the municipal corporations are awakening to a right sense of what is for the general benefit, a larger corporation is, we fear, lethargic, if not inimical. The destruction of Epping Forest goes on despite the "Resolution" of the House of Commons; and the New Forest—a place which, if out of England, educated Englishmen would run over half the world to visit—is irreparably injured, and in a fair way of being destroyed. But our few fragments of forests are not all we are losing. The commons are being everywhere enclosed, and the field paths stopped or diverted. In a few years it

would seem that our improvements will leave scarcely a free field walk anywhere, save where the land is too barren for profitable enclosure. The loss of Hampstead Heath has, however, been averted. The death of Sir Thomas Maryon Wilson has enabled the Metropolitan Board of Works to purchase the manorial rights over Hampstead Heath for 45,000*l.*; and if Parliament sanctions the purchase, as no doubt it will, the Heath, though of late years barbarously mutilated —still one of the pleasantest spots round London—will be secured for permanent public enjoyment.

The water supply of our great towns, the pollution of rivers, and the disposal of town sewage, are questions of too great importance to be discussed briefly in a general summary of the improvements of the year. All of them are, or recently have been, under investigation by commissioners, whose reports, with the evidence they have collected, may be expected to do much to remove the difficulties which have hitherto prevented the successful solution of the several problems involved in their consideration.

3. Churches and Chapels.

Church architects continue to find abundant employment. Fewer great churches have perhaps been erected, but the total number of new churches consecrated during the year is probably not much below the average. As regards their general character, there is nothing new to say. Except in the instance of a few dissenting chapels, Gothic is the only style now employed in ecclesiastical architecture, and it is so closely associated with our ordinary religious services, and possibly with our religious feelings, that he would be a bold man who would propose to design a church in any other style. This being so, and Gothic being universally accepted as the true style for ecclesiastical edifices, it might be expected that some true and distinctive form would have been evolved from the chaos of centuries and countries, which should have had a special adaptation to the better feelings and aspirations, the mental culture and the exigencies of the present time. But nothing of the kind has occurred, nor seems likely to occur. On the contrary, the probability appears to be that we shall in our ecclesiastical architecture settle into a system of stereotyped conventionalism, as is, and always has been, the tendency of all art-work when under clerical influence and control. The outer vestment, so to speak, may alter with the altering fashions, but the framework has become rigid.

The reigning fashion of Gothic is that of the thirteenth century, that usually called Early English, but which, being in its essential features quite as distinctively the style of French ecclesiastical buildings in the thirteenth century, as of English, is better named the First Pointed. But almost always it is a late phase of First Pointed that is employed. The windows in the body of the church are lancets, but in the gables, rose windows with plate tracery are frequent. When a later style is employed it is usually Second Pointed, but of an early type—mouldings and other features of First Pointed character being by no means infrequent. Now this commingling of the characteristics of different periods, without any attempt at fusion into an homogeneous

whole, is as wrong æsthetically as it is chronologically. Every true architectural style has been developed from some previous style, not formed by an eclectic process. The old Gothic churches, in which features of different periods are present, grew to be what they are by successive additions. We build by precedent, and fancy we are following in the footsteps of those whose works we imitate.

This last remark applies especially to the interiors. In these the passion seems to increase for costly carvings, colour, and pictorial decoration, but always mediæval in character, and trivial and almost barbaric in taste. Simplicity, refinement, and grace are ignored, and a rude splendour sought after, without significance or dignity, and in the pictorial decorations too often without propriety, and only to be palliated (hardly to be justified in their palpable unveracity) on the plea that they are reproductions of what ecclesiastics regarded as true and beautiful four or five centuries ago.

However, let us recognise, and be thankful for, what is good in what is being done. If the exteriors of churches are made unnecessarily and often oppressively ugly and the interiors tawdry, they are yet more carefully planned than heretofore with reference to their purpose. The area is less obstructed by heavy columns, the chancels are better arranged, and a congregation can now generally see, and sometimes hear, and consequently join in, the service, from nearly every part of the building.

Great opportunities have been afforded to architects for designing town churches especially adapted to the exigencies of the present time. Never before probably were so many churches built within the same period in the crowded streets of our large cities, and the work goes on without abatement. From every one of our great manufacturing centres we have accounts of the consecration of new churches, and the laying foundation-stones of others. In London we notice that the contributions to the Bishop of London's Fund are approaching in amount to half a million, and though the whole of this large sum is not expended in church extension, seven new churches erected by the fund have been consecrated during the present year, and others are in progress of erection. Whether as much practical good has come out of all this activity as might have been expected is not for us to say; but assuredly the architectural gain has been far less than it ought to have been. It may be questioned whether all this town church building has produced a really good example of what a town church ought to be. Certainly none has been accepted as a model design; and it is undeniable that some of the most recent have been the least satisfactory.

Of the new churches built in London and its vicinity few call for more than a passing note. St. Philip's, Queen's Road, Battersea Park, is one of the most attractive. It is a good Second Pointed building with nave and aisles, chancel, vestry, and tower, and the windows filled throughout with painted glass. The architect was Mr. J. T. Knowles. The cost, about 13,500*l.*, with the site estimated at 3,500*l.*, was defrayed by Mr. Flower, of Furze Down, Tooting—an instance of well applied liberality, of which the reader will find many examples in the following lists.

St. Peter's, Harrow Road, Paddington, is a fair specimen of a rather large town church. It is cruciform; and is to have a tower and spire at the south-west angle; will accommodate nearly 2000 persons, partly in galleries at the west end and in the transepts. The columns which separate the nave and aisles are of polished granite, those in the transepts and chancel of Devonshire marble. The cost has been about 6000*l.*, towards which an anonymous donor contributed 2,500*l.* The architects were Messrs. Newling and Billing. St. Augustine's, Highbury New Park, also owes its erection in a great part to a private benefactor. It is of brick, and externally is not beautiful, and it waits for completion the addition of a tower and spire; but the interior is effective, and is intended ultimately to be rather splendid. It will accommodate 1300 persons, and has already cost nearly 10,000*l.* The architects were Messrs. Habershon and Brock.

Brick is just now in great favour for London churches, and many are built of that material in the country also. Mr. Street, in his interesting volume on the Brick Churches of Italy, has shown how readily the material lends itself to the inspiration of genius; and Mr. Butterfield and Mr. Brooks have given practical proof that brick churches may be adapted to a large town congregation, though both gentlemen are careful to avoid rendering their exteriors too attractive. Generally, however, our architects design their brick churches as though they were to be built of stone, which is a great artistic mistake; every good building yet erected has been designed with special reference to its material, and brick cannot be used successfully in any other fashion. The best of the new brick churches is St. Columba, Kingsland Road, designed by Mr. J. Brooks. The exterior is somewhat grim and monastic in aspect, and will be more so when the clergy-house, schools, &c., which are to come within the enclosed quadrangle, shall be completed. The style is First Pointed, but rather freely treated. The east end faces the road, and has in it two wide and recessed lancet windows divided by a huge buttress, on which is a figure of St. Columba, and under the windows are rilievi from the legend of the saint; while the gable, which contains a large rose window, is flanked by buttresses and surmounted by a tall stone cross. The interior has more character. It is long, wide, and lofty, but almost unbroken, having a broad nave and very narrow aisles, with shallow transepts, a deep and spacious chancel with sacristies, and is embellished with mosaics, encaustic tiles, and a good deal of polychrome decoration. The altar is detached 10 feet from the east wall, and has an elaborate reredos. The chancel and transepts are vaulted; the roof of the nave is of wood. It is evident at a glance that the church is designed for a ritualistic service, and it accords well with its purpose. St. Barnabas, Grove Road, Bethnal Green, is another brick church designed for a poor locality, but less ritualistic, and altogether less striking in character. The chief feature in which it differs from the usual church pattern is the large baptistery on the south. The use of coloured bricks is mainly relied on for internal effect. The principal entrance is by a partly detached tower at the south-west angle of the church. The style is early Second Pointed. It has cost about 4000*l.*, and will accommodate a con-

gregation of 900. The architect was Mr. Wigginton. A brick church very different from both these is St. Luke's, Kentish Town, designed by Mr. B. Champneys. The material is a deep red-brick; the style First Pointed; it stands in a conspicuous position, and has the appearance of being solidly constructed, but certainly abuses the privilege which modern brick churches claim of being ugly. It consists of a lofty nave and low aisles, with, interposed between the nave and apsidal chancel, a huge tower, buttressed, and terminating in gables. Close by it stands the parsonage, also of brick, and nearly as morose in aspect as the church. Less pretentious is another brick church recently consecrated in Kingsdown Road, Upper Holloway. The exterior is of stock brick, plain, and though very high the roof extends in an unbroken line over nave and chancel; a light octagonal bell-turret alone affords a little relief—the tower being reserved for another day. The internal walls are relieved by bands and arches of red brick, but there is little other ornament. The nave arches are borne on coupled columns of polished Peterhead granite. The church will accommodate about 700 persons, and has cost over 5000*l.* The architects were Messrs. Jarvis and Son. In the same quarter of London another brick church, St. Anne, Poole Park, has been erected from the designs of Mr. A. D. Gough, but in this the architect has evidently been looking for his model among the brick churches of Italy. The result is of a somewhat hybrid character, but better than the endless repetitions we have of particular forms and details. Black, white, and red bricks are of course mingled inside, but outside the dressings are of stone. The church will accommodate about 1000 persons, and has cost about 6000*l.* In the church of St. Andrew, Upper Westbourne Park, there are also evidences of Italian influence. The church is a spacious cruciform structure, with accommodation for 840 persons. It cost 8000*l.*, of which a lady, who withholds her name, contributed 5000*l.*, and the Bishop of London's Fund 3000*l.*

A little farther outside London several good churches have been erected, to a great extent by individual liberality. St. Andrew's, Plaistow, designed by Mr. Brooks, is a cruciform building with a central tower, and is constructed of Kentish rag, with dressings of Bath stone. As is now very commonly the case the interior is the most interesting portion of the building. Here the effect is rather striking, alike from its length and altitude and the pompous character of the chancel, which is apsidal, and 60 feet deep, the nave being about 100 feet, while the altar with its elaborate reredos is elevated nine steps above the nave. The church will accommodate 1200 persons—all the seats being free and unappropriated. The cost has been about 10,000*l.*, but 4000*l.* more will be required to complete the tower. St. James's, Knatchbull Road, Brixton, is a late First Pointed cruciform building, designed by Mr. G. Low, and erected at the cost of Mr. J. L. Minet. It is of Kentish rag, with Bath stone dressings; has an apsidal chancel, and a stone tower and spire on the north side of the church 140 feet high. It has nearly 800 seats, and cost about 7,500*l.* St. Mark the Evangelist, Lewisham, is a rather handsome Second Pointed building of Kentish rag with Bath stone

dressings, designed by Mr. W. C. Banks. It is to have a tower and spire 160 feet high.

Christ Church, Finchley, is a cruciform building of stone lined with brick, the design of Mr. J. Norton, pleasing in its general outline, and very carefully finished. The style is French First Pointed, but the great rose window at the west end, the pinnacled and crocketed buttresses, tower, and portico or narthex, all picturesque in themselves, and giving variety to the general form, and play of light and shade to the surface, are of later character. Churches have also been completed at Wickham Road, New Cross, Deptford, at Streatham, and elsewhere in the vicinity of London, but we pass on to notice two semi-metropolitan churches of wider interest.

Croydon Church, of which we last year announced the approaching completion, was opened in January. It is, as far as may be, a reproduction of the old church, but necessarily it lacks its venerable aspect. Mr. Scott has, however, done his work worthily, and the church is one the people of Croydon may well be proud of. Like its predecessor, it is early Third Pointed in style; indeed, the chief difference is, that the new church has a longer chancel. The remarkable archiepiscopal monuments which were so nearly destroyed by the fire have been, as we think, judiciously left in their mutilated condition. As they are, they are more impressive than ever; restored, they would lose every particle of interest. With the new parish church of Kensington, Mr. Scott is making steady progress. Sorry as we are to lose the old church with all its associations—which can never be replaced or restored, it would be idle to deny that the new church will be, in all other respects, a vast improvement. Like the generality of Mr. Scott's recent churches, there is just a suspicion of too great correctness in the design, but else it promises to be a noble building. It will be cruciform, but, as is now almost universal, the transepts will be shallow—mere lodging places, on the one side for the school children, on the other for the organ. The church will consist of nave and aisles, and a deep chancel. A massive tower and lofty octagonal stone spire at the north-east angle will, no doubt, be an effective object in entering Kensington from town.

Several other churches are in progress in London and its environs. One or two will serve as illustrations. St. Stephen's, South Hampstead, is expected to be ready for consecration at the end of 1870. It is by Mr. S. S. Teulon, and is one of those rather peculiar semi-French First Pointed edifices of which he is so fond. It consists of nave with aisles, chancel with apse, and tower; the lower part of the tower forming part of the chancel, of which the apse is the eastern termination. When funds are obtained transepts will be added, and the tower will be carried up to a height of 135 feet. The church is built on a slope, of which advantage has been taken to form what in the old times would have been a lower chapel or crypt, but is now intended to serve for a vestry. This deviation from the established type gives the church, from some points, a character of picturesqueness, where otherwise it would have been only quaint. St. Jude's, South Kensington, is a spacious early Second Pointed cruciform building of some architectural pretensions, lately commenced from the designs of

Messrs. G. and H. Godwin; it will have accommodation for 1600 persons, and is estimated to cost about 11,000*l.*, without the tower, spire and fittings. In July last the Prince of Wales, in presence of an august assembly, laid the memorial-stone of St. Saviour's Church for the Deaf and Dumb. The church, which is situated at the corner of Queen Street, Oxford Street, will be novel in its architectural character as well as in the purpose to which it is to be applied. It will be of red brick and stone, First Pointed in style, a Maltese-cross in plan, an octagon above, the ceiling will be groined and have a circular opening for a sunlight. Four sides of the octagon will have large triple lancet windows, and the apse, which will have a stone vaulting, will be lit by five lancets. Externally the building will be crowned with a tall octagonal roof, which will have a row of small lucernes near the apex. The church is intended to accommodate about 250 persons. The architect is Mr. A. W. Blomfield.

As an example of some of the various kinds of country churches we are likely to see, now that the desire of novelty is responded to by the free importation of continental Gothic, we may notice the new church of Flyingdale, near Pickering, in the North Riding of Yorkshire, designed by Mr. G. E. Street, A.R.A. The church is built of local stone, and consists of nave and south aisle, north chapel, chancel with apsidal sacrarium, and a tower with saddleback roof 120 feet high. The interior is 120 feet long, 45 feet wide, and nearly 50 feet high; the chancel is raised two steps above the nave, the sacrarium two steps above the chancel. The style is early Second Pointed, of a German type. The windows of the nave, aisles, and clerestorey have quatrefoil tracery; the west window is of four lights, with alternate quatre- and cinquefoil; the three windows in the apse of the sacrarium have trefoil heads and tracery. Throughout symbolism is duly heeded, and if the worshipper fails to be impressed with the beauty of the edifice, he may perhaps be edified by its ecclesiological teaching. The church affords accommodation for 450 persons, and cost about 6000*l.*, a large portion of which, as well as the site, was presented by Mr. R. Barry, of Park Hill.

As representing a public improvement of a most desirable kind, we will cite here the church of St. Mark, Talbot, Dorsetshire. Some five-and-twenty years ago, Miss G. C. Talbot, believing that something might be done to improve the condition of the peasantry settled in these parts, bought a tract of barren heath lying nearly midway between Poole and Bournemouth, drained it, laid it out in convenient portions, built comfortable cottages on it, and a school-house, which served also as a chapel. As the settlement rapidly grew into a village, Miss Talbot extended her operations, adding to the school a set of almshouses, and endowing them with a sum of 7000*l.*, and finally erecting a church at a cost of 5000*l.*, and adding an endowment of 3400*l.* The church is described as a handsome building, but it does not appear to possess any special architectural merits. Miss Talbot did not live to see this, the crown of her benevolent efforts, completed; but was, by her desire, interred in the churchyard.

Christ Church, Kensington, near Liverpool, which has been built at a cost of over 10,000*l.*—provided chiefly by Miss Colquett, of

Liverpool, may be noticed for its divergence from the ordinary model. It is officially designated Romanesque in style, but appears to be a free adaptation of the early round arched ecclesiastical type which, with local variations, prevailed in many parts of Italy. It is a spacious edifice, designed by Messrs. Audsley, of Liverpool. It is of stock brick, with red and black brick and stone bands; is cruciform, with a western tower and spire 150 feet high, and will accommodate 800 worshippers. The nave arches are carried on polished red granite columns, the carvings are generally of Caen-stone, and there is a good deal of ornament; but the interior is chiefly remarkable for its light aspect, due to the unusual number and size of the round arched and rose windows. Not having seen the building, and having heard widely different opinions respecting it, we confine ourselves to this bare statement.

The other new churches we may refer, as in former years, to a list arranged under the First Pointed (or Early English) and Second Pointed (or Decorated) styles; we do not add Third Pointed (or Perpendicular) because a church is now scarcely ever erected in that style except when, as just noticed at Croydon, it takes the place of an older church, the memory of which it is desired to perpetuate. The arrangement must, however, as we have before explained, be regarded only as a matter of convenience, and implying merely that the respective churches approximate, more or less closely, to the style under which they are placed. Thus, roughly speaking, the First Pointed churches, as we have already observed, may now be generally understood to be *late* First Pointed; the Second Pointed, *early* Second; and in both classes there will usually be some foreign and commonly French element. When not otherwise stated, the church may be understood to consist of a nave and aisles, chancel, vestry, and tower, or tower and spire; unless it be a small church, when it will ordinarily have only nave and chancel, with a bell-turret instead of a tower.

Among the churches First Pointed in style are:—St. Silas, *Hunslet*, Leeds, one of several new churches erected by the Leeds Church Extension Society. It has shallow transepts, that on the south serving as an organ chamber, the north as a vestry; a tall apse with five lancets, and at the west end a belfry with steep gables; 700 sittings; cost 4000*l.*; architect, Mr. Corson of Leeds. Holy Trinity, *North Ormesby*; of brick; nave, north aisle, and porch; 450 sittings; cost 2000*l.*; architect, Mr. W. White. St. Mary, *Strood*, Kent; of Kentish rag, with freestone dressings; 98 feet long by 48 wide, with tower and spire at the west end; architect, Mr. A. W. Blomfield. Emmanuel Church, *Preston*, Lancashire; cruciform, of stock brick, with string courses and bands of coloured and moulded bricks, and stone dressings; about 850 sittings; architects, Messrs. Myres, of Preston. St. Paul, *Lexden*, near Colchester; 214 sittings, cost 2000*l.*; architect, Mr. J. Clarke. St. Matthew, *Midgham*, Berks; an elegant little building for a congregation of 250, erected at the expense of Mr. B. B. Greene, of Midgham House, from the designs of Mr. J. Johnson. It consists of a nave and south aisle, divided by polished granite columns, a family chapel on the north, chancel, porch, and a tower and stone

spire 105 feet high at the south-west; the material is flint, with the interior walls and dressings of Bath-stone. St. John, *Gatesgill*, Cumberland; of local stone; the chancel windows filled with painted glass; 150 sittings, all free, cost 1300*l*; architect, Mr. J. Lowe, of Manchester. St. John the Evangelist, *Cotehill*, near Carlisle, Cumberland; of the local white and red sandstone; nave 50 feet by 30, and chancel 20 feet square, with a tower surmounted by a light lantern; cost 1250*l*. St. Gabriel, *Upper Easton*, near Bristol; of brick; 700 sittings, cost 3000*l*.; architect, Mr. J. Neale, of Bristol. *Tardebigg*, near Bromsgrove, Worcester; of local red and gray stone, with Bath-stone dressings; 200 sittings, all free; designed by Mr. Preedy, and finished with great care and taste: erected and endowed by the late Baroness Windsor. St. James, *Brighouse*, Yorkshire; 600 sittings; cost 3800*l*.; architects, Messrs. Mallinson and Barber, of Halifax. Holy Innocent, *Shefford*, near Newbury, Berks; of flint, with Bath-stone dressings; apsidal chancel, with a good deal of carving; architect, Mr. C. F. Hayward. Holy Trinity, *Westward Ho*, near Bideford, Devonshire; of local stone, with Lundy Isle granite and Forest of Dean stone external dressings, and Bath-stone inside; 400 sittings, cost about 2000*l*.; architect, Mr. W. C. Oliver, of Barnstaple. All Saints, *Burton-in-Lonsdale*; erected by Mr. T. Thornton, of London, in place of the old parish church. St. Peter and St. Margaret, Eastgate, *Lincoln*, of local stone, with Bath-stone dressings; nave and north aisle, chancel, organ chamber, and porches; east window of painted glass; 500 sittings, cost 2500*l*; architect, Mr. A. W. Blomfield. *Newton-upon-Rawcliffe*, near Pickering, Yorkshire; of local stone; 150 sittings; architect, Mr. W. Tarn. St. Peter, *Ryhope*, Durham. *Yafforth*, near Northallerton; a neat little church, with a painted glass east window, designed by Mr. Pritchett, of Darlington. St. Michael, *Little Marcle*, Herefordshire; of local red sandstone, with Bath-stone dressings; small, but with some amount of internal decoration; architect, Mr. W. Hugall, of Oxford. *Alston*, Cumberland, on the site of the old church; 420 sittings; cost 5000*l*.; tower left for completion at a future day; architect, Mr. J. W. Walton. St. David, *Wettenhall*, Cheshire; cruciform; on site of old church; 200 sittings, all free; architect, Mr. J. Redford, of Manchester. Christ Church, *Silloth*; cruciform, the transepts very shallow; the exterior of Irish granite; the interior lined with red and white bricks; 500 sittings; cost 3000*l*.; tower to be added; architect, Mr. C. J. Ferguson. St. James the Less, *Great Ancoats*, Manchester; of stock brick, with coloured brick bands and stone dressings; 650 sittings, cost 2500*l*. St. James, St. James's End, *Northampton*; nave and chancel, south aisle and chapel; the clerestorey carried on an arcade of polished granite shafts, granite and marble shafts being also freely employed elsewhere; 500 sittings; cost 2700*l*.; architect, Mr. Keightley, of Northampton. *Whitfield*, Northamptonshire, on the site of, but larger than, the old parish church, of which the tower was blown down and the body of the building injured in a storm, February 1869; an elegant building, designed by Mr. H. Woodyer.

Churches, Second Pointed in style, have been erected among other places at—*Ruswarp*, near Whitby, Yorkshire, with an apsidal chancel;

architect, Mr. C. N. Armfield, of Whitby. St. Swithin, *Lincoln*; of Branston stone, faced internally with Ancaster stone; 1000 sittings; architect, Mr. Fowler, of Louth. The parish church of St. Peter, *Brimpton*, Berkshire, has been rebuilt, except the tower, at the cost of Mr. J. Blyth, of Woolhampton House, from the designs of Mr. J. Johnson, in a substantial and costly manner, the columns which support the roof being of polished red granite, and the whole of the internal fittings of oak, walnut, and chestnut, from the Woolhampton estate; several of the windows are filled with painted glass. St. Stephen, *Hulme*, Manchester; of brick and stone; with some peculiarities of design, but early Second Pointed in general character; 750 sittings, cost 5000*l.*; architects, Messrs. M. and T. Taylor of Manchester. St. Mary, *Mistley*, Essex, on the site of the old church; 100 feet long (including chancel 20 feet), and 51 feet wide, with a tower at the north-west angle; of Kentish rag, with Bath-stone dressings; 600 sittings, cost about 4500*l.*, spire to be added at a future day; architects, Messrs. Wadmore & Baker. *Evancoyd*, Kington, near Hereford; a neat and carefully-finished little church, by Mr. T. H. Wyatt. St. John the Baptist, *Keele*, Staffordshire; a well-built and handsome church erected at the cost of Mr. R. Sneyd, of Keele Hall, from the designs of Mr. T. Lewis of Newcastle; of local stone, with Hollington stone dressings, the walls being lined inside with Weston stone. St. Thomas, *Sutton Crosshills*, Yorkshire, designed by Mr. W. H. Crossland; 430 sittings, cost 4000*l.*, defrayed by a bequest of Mr. T. B. Bairstow, of Sutton Mill, to whose memory the east window has been filled with painted glass by Clayton & Bell. St. Mary, *Carlisle*; of local red freestone; early in character; semicircular apse, the nave divided from the aisles by columns of green Kilkenny marble; about 600 sittings, cost 6000*l.*; architect, Mr. E. Christian. St. Nicholas, *Droitwich*; nave and south aisle with a tower at the south-west angle; windows filled with painted glass; 250 sittings, all free. St. Helen's, *Ore*, near Hastings; in place of the old church, but on another and very commanding site, the lofty tower and spire of the new church forming a conspicuous and useful sea-mark; the church has nave, aisles, and chancel, and will accommodate 400 persons; architects, Messrs. Habershon & Brock. *Llangunllo*, on the site of the old parish church, and nearly of the same dimensions; 200 sittings, cost about 1800*l.*; architect, Mr. Middleton of Cheltenham. St. Cuthbert, *Nether Denton*, Cumberland; in place of the old parish church; of local white stone, the roof slabs of Wetheral red sandstone; 140 seats, cost about 1000*l.*; architects, Messrs. Cory & Ferguson. *Hounsdown*, near Southampton; an elegant little church, designed by Mr. B. Ferrey for a congregation of 200; of brick and flint with stone dressings, the interior lined with hand-painted encaustic tiles; the east window filled with painted glass by Clayton & Bell. *Colbury*, Hampshire; a carefully-finished little church, designed by Mr. Ferrey, and erected at the cost of Mr. and Miss Ibbotson, the east window being filled with painted glass as a memorial of Mrs. Ibbotson. St. Andrew, *Hertford*; on the site of the old church, the tower only being retained; of flint and stone; cruciform; early in character, with rose windows and plate tracery; 650

sittings; cost 3850*l.*; architect, Mr. J. Johnson. *Roath*, near Cardiff, erected by the Marquis of Bute on the site of the demolished parish church; of Newbridge and Bath-stone; interior rather rich in decoration and fittings; 400 sittings; cost 6500*l.*; architect, Mr. J. Pritchard. St. Mary, *Halifax*; a large and handsome building, the chief external feature being a tower and spire, 135 feet high, at the north-west angle; erected at a cost of 8000*l.* by Mr. M. Stocks, of Upper Shelden Hall. St. Andrew, Leeds Road, *Huddersfield*; has short transepts for organ and school-children; tower and spire to be added; interior, of pleasing appearance, has some good carving; 500 sittings; cost 4300*l.*; architect, Mr. W. H. Crossland. St Mary, *Hopton Castle*; on the site of the old parish church; 100 sittings; architect, Mr. Nicholson of Hereford. St. Stephen, Byrom-street, *Liverpool*, is chiefly noticeable on account of the adoption of the reprehensible practice, not uncommon in the chapels of some bodies of dissenters, but happily hardly known in churches of the establishment, of having a school under the church. The architects were Messrs. Culshaw & Sumners of Liverpool.

The progress of church restoration continues with relentless energy, every day, almost, witnessing the destruction of some irreplaceable vestige of our venerable parish architecture. But though in every restoration some relic of antiquity is necessarily destroyed, it is only fair to acknowledge that now, as a rule, restoration is carried on in a less reckless way than of old. Mr. Scott has done good service by his resolute advocacy of "conservative restoration," and his distinct statement that in every restoration he may undertake he is determined strictly to preserve untouched so much of the old work as is capable of preservation. This clear expression of opinion by one who is recognised as the chief of this branch of the profession cannot but exert a powerful influence. Still, whatever architects may promise or intend, it is always found, when the work is actually in progress, that builders and clerks of the works, who are the potential directors, care much more for clean work than for old time-worn stones.

One piece of restoration which approaches towards completion, though it has been of the most sweeping kind, will rejoice all but the merest antiquary. The magnificent Chapter-house of Westminster Abbey, by years of neglect and centuries of ill-usage, had been brought into a deplorable condition. Under the competent direction of Mr. G. G. Scott, R.A., the noble old building has been almost entirely reconstructed—the old stonework being, however, scrupulously retained wherever practicable. The masonry is nearly complete, and looks exceedingly well, but it is too soon to speak of the restoration as a whole. The building will probably be opened to public inspection before the publication of the next volume.

The restoration of St. Paul's, as it has been called, but what really should be the completion by means of the internal decorations of Wren's original design, has assumed large proportions. The authorities, in their appeal to the public for assistance in carrying out the work, state that "it will cost, not thousands, nor even tens of thousands, but as much perhaps in its final completion as 250,000*l.*" A quarter of a million is undoubtedly a large sum to expend on the decoration

of a cathedral; but if it is desirable that it should be done there ought to be no difficulty about the funds, seeing that it is emphatically the cathedral of the City, the very focus of the wealth of Europe. Only three or four years back one munificent citizen of Dublin paid over 150,000*l.* for the restoration of his city cathedral, and it is impossible to believe that the whole body of London merchants should among them fail to raise less than twice what one man gave. More than three months have passed since the subject was brought before a great meeting of City men summoned for the purpose at the Mansion House. The meeting was enthusiastic, and large sums were collected; but the enthusiasm has hardly been maintained. Perhaps something of the apparent apathy is due to a doubt that appears to be gaining ground, and may as well be expressed plainly, as to the spirit in which the work is likely to be carried out. St. Paul's is emphatically a Protestant cathedral, the only one built since the Reformation. Wren designed it as a place for the new as opposed to the old ritual, and the whole artistic spirit of the building is that of the post-Reformation Renaissance. Several of Wren's City churches have had their interiors renovated or remodelled in a very splendid and perhaps very beautiful way, but in style decidedly pre-Reformation. Now, though it is difficult to believe that anything so flagrant could be intended as to decorate a building like St. Paul's in a mediæval style, yet it is just possible that it might be done in a mediæval spirit; and it is singular, if not significant, that the gentleman who is intrusted to arrange the general scheme is one of the most intense mediævalists of the day, one thoroughly accomplished in his own line, but who holds all post-Reformation work in supreme detestation, and St. Paul's itself in utter contempt. Where this spirit reigns Wren's work is not likely to be touched with reverent hands. Still it is only the general scheme that is likely to be affected; the pervading spirit will depend on the artists to whom the execution of the several parts is intrusted. An explicit declaration that the decorations shall be in harmony with Wren's designs, and, in fact, be merely the completion of them in his own spirit, would, we fancy, speedily bring in the desired contributions.

Considerable progress has been made with the restoration of Chester Cathedral. The exterior of the tower has been renewed, as has also the exterior of the Lady Chapel; many new windows have been inserted, and the nave is being covered with a new roof. Mr. Scott, who is carrying forward the restoration with great care, believes that the whole will be completed in three years. The cost is estimated at about 60,000*l.*, of which nearly two-thirds are promised. On the restorations at Worcester Cathedral, over 50,000*l.* have been expended, and half as much more will be necessary to complete the works. The appearance of the cathedral has been greatly changed, but the manner in which Mr. Scott has carried on the restoration seems to meet with general approval. The works at Bristol, Gloucester, and St. David's, have been continued in a satisfactory manner.

No Roman Catholic Church of much architectural importance has, as far as we know, been completed during the year. The Church of the Sacred Heart, Eden Grove, Holloway, is a good-sized brick

building, late First Pointed in style, of a decidedly foreign type, and, with the connected clergy-house and schools, will present a picturesque appearance when the tower, an essential feature of the design, has been added. It is situated in a poor neighbourhood, and the exterior effect is made to depend more on form than ornament. The architect was Mr. F. H. Pownall. In the country, churches have been completed at *Goole*, Yorkshire, a brick building, with bands of black and red bricks, and stone dressings, designed by Messrs. Hadfield, of Sheffield; at the Brooms, *Leadgate*, Lanchester, Durham, the Church of Our Lady and St. Joseph, a handsome early Second Pointed French Gothic building, having accommodation for 700 persons, designed by Mr. E. W. Pugin; and others at Stanningfield, Harwich, Southend, and elsewhere. Of those in course of erection, the most costly is one which the Duke of Norfolk is building at Arundel, under the shadow of his castle, and in close proximity to the fine old parish church. It will be cruciform, of large size, have a tower and spire 260 feet high, be fitted with great splendour, and cost, it is said, at least 50,000*l*. The architects are the Messrs. Hansom.

Among the dissenting bodies there is the usual activity; but little novelty. With their freedom from ecclesiastical precedent they might have been expected to work out some form of church which should unite congregational convenience with a grave suggestive devotional aspect. But they have been content to accept a few slightly varied designs, which have made the conventicle approach as nearly as may be in its outside appearance to the orthodox church, while the interior is only a smartened version of the familiar chapel. According to the last annual reports of the Wesleyan Methodist Chapel Committee, that body sanctions the erection of over a hundred chapels yearly; and the engravings published by them of chapels completed and in progress exhibit considerable variety of style, though generally, as among churchmen, the early First Pointed is most prevalent. One of the showiest of the new chapels is that in Mostyn Road, Brixton Hill, but it appears to be only a modification of one by the same architect, Mr. Tarring, of which we gave an engraving three or four years back. Somewhat more of novelty is imparted to the design of Newton Abbot Chapel, Devonshire, but novelty in this case is hardly an improvement; and we do not observe any other to which it is necessary to call attention. At the recent Burslem Conference it was announced that "during the next year it is proposed to build ten new chapels in London, and that 10,000*l*. had been offered for that purpose."

Among the Congregationalists there seems to be some diminution in church-building activity—or perhaps only a lull. At *Exeter* a large and rather unusually ornamental building has been completed at a cost of about 10,000*l*., and containing 1000 seats. The chief feature of the exterior is the spire 150 feet high. St. Anne's Well Road Chapel, *Nottingham*, is of red brick with bands of blue bricks, and stone dressings; early Second Pointed in style, with a large rose window at the east end filled with stained glass. At Derwent Street, *Derby*, an early Second Pointed building, with accommodation for 500 persons, has been erected from the designs of Mr. Tait, of

Leicester. Others have been built at *Dunmow*, Essex, with 900 sittings, designed by Mr. C. Pertwee, of Chelmsford; at *Stone*, First Pointed in style, with 700 stttings, designed by Mr. Bidlake, of Wolverhampton; at *Buttershaw*, near Bradford, Yorkshire, designed by Mr. J. Pritchett, of Darlington; at *Yarmouth*, designed by Mr. J. T. Bottle; at *East Grinstead*, Sussex; at *Normanton*, Leicestershire, and several other places.

The Baptists still resist the Gothic influence. One or two of their recently completed chapels may be cited as examples of the buildings they most affect. *Farsley*, Yorkshire, is a neat Italian building, designed by Mr. J. Simpson, of Leeds, which, from standing in the midst of a large open space, afforded opportunity for distinctive effect. At *Bedford*, the plain old chapel has been superseded by a somewhat more ornamental but still inexpensive Romanesque building, designed by Mr. Usher, of Bedford. At *Bolton*, a large chapel, Italian in style, has been built from the designs of Mr. G. Woodhouse; it has seats for 1000 persons, and the objectionable feature of a school-room for 500 children under the chapel: the cost was 6500*l*. At Mutley Plain, *Plymouth*, a large chapel has been built, somewhat similar in plan, having also a school for 500 children under the chapel. It has cost 8000*l*., is in style classic Italian, and was designed by Mr. Ambrose, of Plymouth.

The United Presbyterians have likewise built several churches, and in very various localities, as at Stratford, Sunderland, Beaumaris, Leicester. Generally they are First Pointed in style, and have a tower and spire, or at least a bell turret.

We have exceeded the space reserved for this section, but must mention one or two ecclesiastical buildings of an exceptional class. Last year we noticed the completion of a new Jewish synagogue at Chatham; this year two of a costly character have been consecrated in London. The Central Synagogue, Portland Road, is a branch of the Great Synagogue, Duke's Place, City. The building, designed by Mr. N. S. Joseph, must be described as Moresque; but the exterior suffers from being of ordinary stock brick. Still it is not ineffective, seeing that only a level street front could be shown. The interior is richer, and has a singular effect, from the centre being reserved for the performance of the service, and the seats for the male worshippers being arranged longitudinally at the sides, while the female portion of the congregation is relegated to the galleries. An apsidal recess at the end, with a roof domed and diapered after the Alhambra fashion, serves as the sanctuary. The cost, with the priest's house, has exceeded 24,000*l*. The New Synagogue, Upper Berkeley Street, Edgeware Road, is for a congregation which differs in some points from the orthodox. The building is Byzantine in style, and has a large central cupola, borne on four pairs of clustered columns of Devonshire marble, with four smaller cupolas at the angles. In this building a semicircular apse at the east end contains the ark and forms the sanctuary. Provision is made for 500 worshippers on the floor, and as many in the galleries. The interior is richly fitted, and colour is introduced freely but unobtrusively. The cost has been about 20,000*l*. Messrs. Davis and Emanuel were the architects.

A stately Greek Church, in the Princes Park Road, Liverpool, was, in January last, consecrated by Lycurgos, Archbishop of Syra and Tenos. An imitation of the church of S. Theotokos, Constantinople, it is in the form of a Greek cross, is massive in construction, and consists of a narthex or vestibule; nave, or body of the church, which will accommodate 600 worshippers, and is lit by a great central dome; and sanctuary, which is separated from the body of the church by an elaborate screen. Besides the great central dome there are three of smaller dimensions. The exterior is said to have an imposing appearance; the interior to be rich in marbles, velvet, and sacred paintings, but it is intended to add a great deal of mosaic and coloured decoration. The building has cost 15,000*l.*, but at least 10,000*l.* more will be required to complete it.

4. Buildings for Public Purposes.

For our illustration of municipal works in progress we have this year selected the new Town Hall, Manchester. Usually our engravings are taken from buildings completed or approaching completion; but as we found no civic building exactly suitable, and we wished to interest the reader in the progress of the new Manchester Town Hall, a building which, to our thinking, promises to be the noblest of its class erected for many a year in England, we requested the architect of that structure to permit a copy of his design to be made for engraving. To this he kindly assented, and added on the block such modifications as he proposes to make in executing the design. The site of the Manchester Town Hall presented grave difficulties to an architect. In form it is a truncated triangle of unequal sides, the available frontage being, the base, in Albert Square, about 330 feet; the southern side, Lloyd Street, 360 feet; and Princess Street, 400 feet; while the apex, truncated obliquely towards Cooper Street, affords a front of about 110 feet. In adapting his plan to the site, not only has Mr. Waterhouse made every square foot of ground serviceable, but he has succeeded in his elevations in rendering the awkward obliquities with which he had to deal conducive to the picturesqueness, and yet not inimical to the grandeur of the building. With a classic or an Italian elevation this would necessarily have been impracticable. Mr. Waterhouse, by preference essentially a Gothic architect, chose Gothic for his design. But here, or we are mistaken, we see evidence of what we have so long desired, a Gothic that is a natural development from the architecture of the Middle Ages, not a repetition of it. If the old forms are largely here, there is yet something beyond them, and that, as it seems to us, the outgrowth of the author's imagination and intelligence, comprehending the special requirements of the case and supplying what is required.

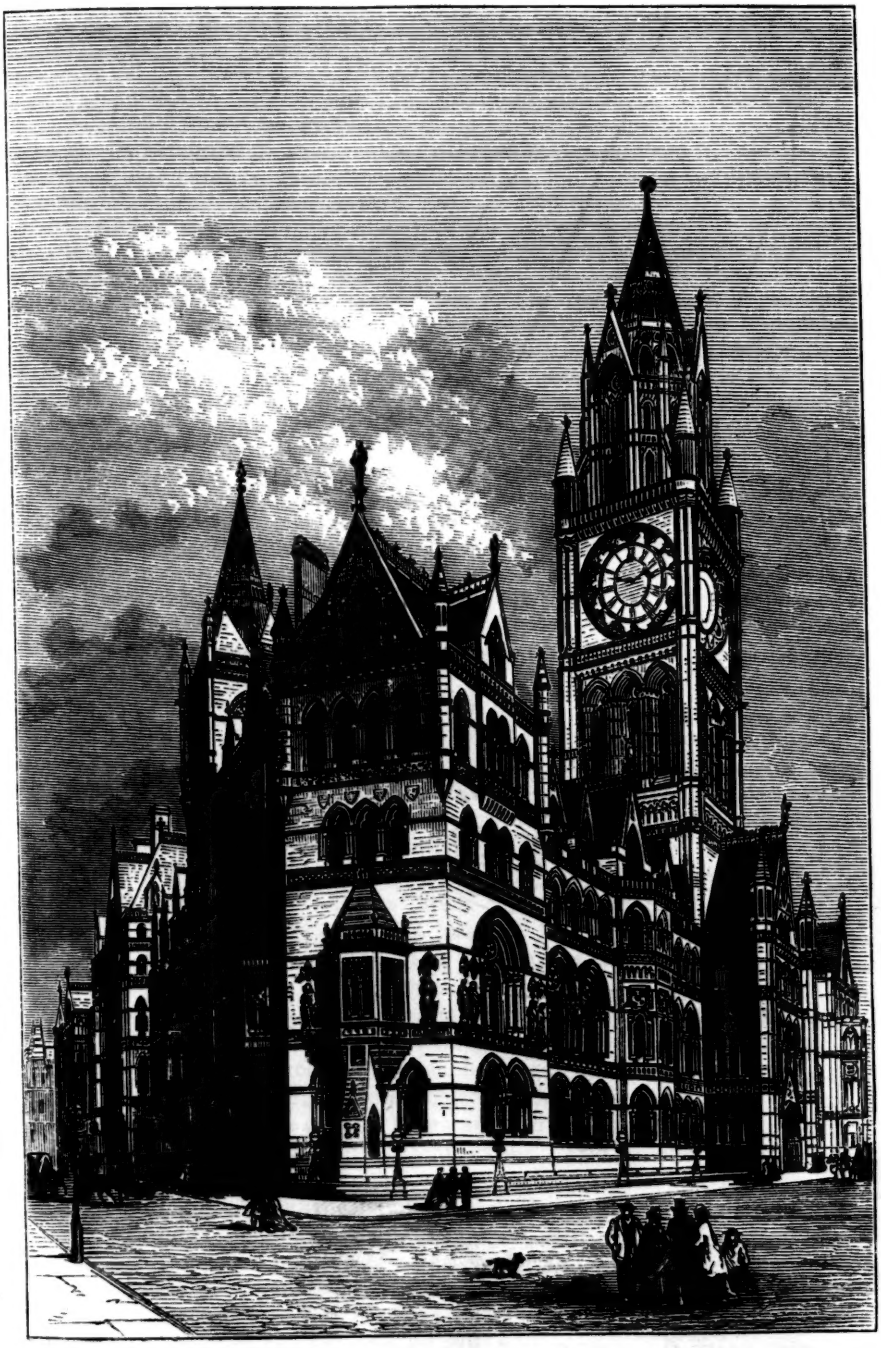
The engraving will show the character of the building. The grand front (on the right) is of singular richness, yet broad, massive, and well composed, and its large features will present a good play of light and shade. The other fronts are less magnificent, but hardly less effective, and each has a distinctive character. Even the narrow

Cooper Street elevation (the truncated apex of our original triangle), it will be seen, is pleasing and characteristic in itself, and of effectual service in the composition.

The interior is not a whit behind the exterior in ingenuity of plan or architectural magnificence. The centre of the area is occupied by a noble public hall, about 100 feet long and 50 feet wide, having a well-designed open-timber roof of six bays borne on groups of clustered columns. Open spaces outside the hall afford light and ventilation, while round the three sides of the building is a complete range of corridors with groined stone roofs—comparable to the grand old cloisters of mediæval abbeys—presenting a multiplicity of picturesque points of view, and affording ready access to the various parts of the building. The mayor's reception-rooms are the state-rooms of the building, and they promise to be worthy of the splendour of Manchester hospitality. They occupy the whole first floor of the principal front, and will form on grand occasions a suite of stately rooms 300 feet long. The approach to them is by a grand staircase of a novel, but rich and effective character. The rooms in the other fronts are for various municipal purposes. The clock-tower will be about 240 feet high, and from its mass and position will be a conspicuous object from many parts of the city. The cost of the building is estimated at 250,000*l*. The walls are now rising, but the building will probably not be completed much under three years from the present time.

In remarkable contrast with the Town Hall, as regards style, will be the new Manchester Royal Exchange, in course of erection from the designs of Messrs. Mills & Murgatroyd. This will be a large semi-classic structure of which the chief external feature will be an octostyle Corinthian portico, approached by side flights of steps, which will form the main entrance. The great room will be 180 feet by 96 feet, divided by Corinthian columns into a nave and narrow aisles, and lit by a central cupola 120 feet high, and two smaller segmental cupolas. A circular tower 180 feet high will rise from the Exchange and Market-street corner of the building.

The foundation-stone has been laid of a Town Hall at Bradford, of considerable architectural pretension, designed by Messrs. Lockwood & Mawson; and another, of large size, is about to be erected at Plymouth; but those completed this year have been of minor importance. Grantham Town Hall and borough prison is a neat red brick building of Renaissance character, with some tolerable carving in front, and a porch with columns of red Mansfield stone. The great room, which is intended to serve for assemblies as well as town-meetings, is 60 feet long, 30 feet wide, and 21 feet high. The architect was Mr. W. Watkins, of Lincoln. At Stone, a new Town Hall has been erected on the site of the old Blue Bell Inn. It is of white brick with stone dressings, Italian in style, and has a large room 60 feet by 34 feet, and 25 feet high. The architect was Mr. F. Bakewell, of Nottingham. At Rickmansworth a small Gothic Town Hall has been built from the designs of Mr. A. Allom. It is of red brick and Bath-stone, and has a large room 56 feet long, 27 feet wide, and 22 feet high. At Sheerness, Kent, Public Rooms, which are



New Town Hall, Manchester.

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intended to serve also for concerts, have been built from the designs of Messrs. Jeffrey & Skiller, of Hastings. The building is described as Italian Gothic in style; the great room is 100 feet long, 53 feet wide, and 35 feet high. The Durham Assize Courts have been remodelled in an efficient manner under the direction of Mr. W. Crozier; and a handsome new County Court, designed by Mr. Sorby, is advancing towards completion at Barnsley: everywhere, in fact, we have evidence that our country towns are alive to the importance of raising the architectural character of their public buildings.

At Wimborne, Dorsetshire, a new Corn Market has been erected, on the site of the Wesleyan Chapel, from the designs of Mr. J. Fletcher, of Wimborne. It is a Doric building, and includes a Masonic Hall. A Corn Exchange, also classic, but on an important scale, designed by Mr. W. Watkins, of Lincoln, has been commenced at Doncaster; where also a spacious new Cattle Market has just been completed. Markets have also been constructed at Aberystwith and elsewhere. Public Baths on a very complete scale have been built, at the cost of Mr. R. Platt, in Church Street, Staleybridge, and presented to the corporation of that town. A spacious building for a similar purpose is being erected by the corporation of Ashton-under-Lyne, and will contain plunge and swimming baths for women as well as men.

The new St. Thomas's Hospital is expected to be ready for occupation by next spring or early summer. Many of our readers will be familiar with the buildings, which range along the Thames between Westminster Bridge and Lambeth, on land reclaimed from the river by the Southern (or Albert) Embankment. The buildings consist of seven blocks (or pavilions as they are technically designated) of about equal size, with a smaller one between the fourth and fifth, and a long low building, with a tall ventilating shaft, at the Lambeth end, which is to serve for the Medical School. These pavilions, with the exception of that nearest Westminster Bridge, which is the "Administration Block," form the hospital proper. They have each three wards above the ground floor. These have their ends towards the river, and are each 125 feet long, 28 feet wide, and 15 feet high, have flat ceilings, and will each contain twenty-eight beds, placed 8 feet apart. The ward-windows are arranged alternately with the beds at such a level that the patients may look out of them—a kindly provision, but one that would have been more welcome had they looked on to the river. In order, however, that as many as can may enjoy the river view, sheltered balconies have been formed at the end of each ward. The ground floors are divided into smaller wards for surgical, and chiefly for accident, cases. The pavilions, which are 125 feet apart, are connected by covered corridors. A lower range of buildings between the pavilions and Palace Road contains the hall for meetings, chapel, out-patients' department, residences, offices, &c. Every endeavour is being made to render the sanitary provisions, the arrangements for the health and convenience of the patients, and the general economy of the establishment, as perfect as the present condition of science and mechanical skill will permit. In many respects the plan and arrangements differ alike from those of the older London

hospitals, and from those proposed by hospital reformers, but they have been adopted after careful consideration of all the circumstances and conditions of the hospital. All is being completed under the superintendence of the architect, Mr. Currey.

At Cholsey, on a picturesque part of the Thames, a large and rather pleasing building has been erected for the Berkshire Lunatic Asylum. It is on the grand scale now so general in these county asylums, and appears to be complete in its arrangements: externally, it is cheerful in aspect, and the situation is charming. Wonford House, Wonford, about a mile from Exeter, is a first-class asylum for the insane, the patients being admitted by payment. The buildings, which have a handsome frontage of 480 feet, Domestic Gothic in style, are constructed of the local blue shale, with Bath-stone dressings, and command extensive views along the valley of the Exe to Exmouth and the sea beyond. They were designed by the late Mr. Cross, and cost 25,000*l*. A vast Idiot Asylum for the northern counties has been in part completed in the neighbourhood of Lancaster. When finished it will have room for 500 inmates, besides the large staff of officials, as well as extensive workshops, storehouses, playrooms, &c. It is built of a light freestone, and consists of a centre with lofty entrance tower, and two wings; is Domestic Gothic in style, and stands within grounds of 67 acres. The building for the North Staffordshire Infirmary, at Hartshill, the foundation-stone of which was laid by the Prince of Wales, has been formally opened by the Duchess of Sutherland, and is considered to be well adapted for its purpose. Several very large infirmaries for parishes, or unions of parishes, have also been completed, especially in the neighbourhood of London, as at Holloway for the Islington Union; Maiden Lane, Highgate, originally built for St. Pancras, but transferred to the London Central Union; a large Fever and Small Pox Hospital at Homerton; the immense Metropolitan District Asylum for the Imbecile Poor, which has accommodation for 1600, at Woodside, Leavesden, near Watford, &c.—but in the best of them there is something inexpressibly saddening in their cheerless magnitude.

We are glad to see that while these huge receptacles for the sick and suffering poor are increasing, another class of buildings is gaining ground, which, if rightly directed, may go some way to lessen the demand for larger ones: we refer to the Cottage Hospitals, such as that recently opened at Oswestry, and of which several have been established in country villages, and some in the vicinity of great factories, as well as in the smaller towns, and which, where properly conducted, seem to combine admirably many of the medical advantages of the town hospital with homely comforts and nursing. Nor, we are glad to say, have the old-fashioned almshouses for the aged and decayed grown obsolete, though their utility has been questioned. A Mr. G. Earle, of Falmouth, emigrated many years ago to America, prospered there, and having himself settled in comfort at Philadelphia, bethought him of the less successful associates of his boyhood. He has accordingly caused to be erected on one of the best sites in the town, a good Gothic building, with grass plats and gardens, as a comfortable retreat for fifty of the aged and de-

serving poor of Falmouth—to be selected without regard to creed. We are equally pleased to notice that those admirable institutions, Convalescent Homes, are extending. One in all respects commendable, but especially so as an example of the spirit in which our affluent City companies might employ a portion of their wealth, has been opened at Bognor, on the Sussex Coast, by the Merchant Taylors' Company. A mansion standing by the railway station and the sea, in the midst of seven acres of finely-timbered grounds, has been remodelled and adapted to its purpose, and endowed in perpetuity by the Company: it affords comfortable accommodation for fifty patients from the London Hospitals.

5.—Buildings connected with Education, Art, etc.

This year Mr. Waterhouse has been as busy at Cambridge as he was last year at the sister university. But Caius College differs from Balliol in being a foundation of a decidedly post-Gothic age, and one in which architecture like that so much admired at Oxford would be a decided anachronism. Mr. Waterhouse has, however, got over the difficulty, and maintained his consistency very well. He has made a Renaissance design, but has imparted to it an unmistakable Gothic sentiment: very much like what one might fancy an Elizabethan architect would have done, who, from dwelling at Cambridge, or old associations with the University, had come to be thoroughly imbued with the spirit of the place, and could not help working in harmony with it any more than he could help rendering his ideas in the forms current around him. The New Buildings at Caius occupy about half a quadrangle, or portions of three sides of it, and a lofty entrance gate-tower. The site is somewhat confined, and the effect thereby a little marred, but the architecture is ornate and carefully finished, and Caius is now among the most conspicuous of the Cambridge Colleges. Generally, the quadrangle seems to be more admired than the exterior façade, and certainly its general effect is very happy. The windows are square-headed, but over some are round enclosing arches, with arms and supporters very prettily carved in the tympana, and all the doorways are round arched. A stair turret at one angle of the court, with a touch of quaintness, is very effective. The new gateway is far more splendid than the old Humilitatis. On it are placed statues of Edmund de Gonville, Bishop Bateman, and Dr. Caius. At Jesus College a new wing, forming a set of Students' Rooms, has been added by Mr. Waterhouse, of red brick, and harmonising generally with the rest of the buildings. The extensive works at St. John's and Trinity are advancing satisfactorily; and progress is making with the less extensive, but still important works, at Peterhouse and Corpus Christi. The Duke of Devonshire, Chancellor of the University, has just signified his wish to erect a Physical Laboratory, so that in this respect Cambridge will soon be on a level with Oxford.

At Oxford, the great work of the year is the opening of Keble College. The present buildings provide rooms for 100 students, tutors, &c., but the hall, chapel, &c., are only provisional, and the gatehouse will be carried up much higher. As we before said, the

structure is of parti-coloured bricks, and contrasts unfavourably in appearance with the other Oxford colleges; but it is only fair to the accomplished architect, Mr. Butterfield, to remember that the more important features of the design remain to be added. At Christchurch extensive restorations have been carried out both in the cathedral and Tom quadrangle, under the direction of Mr. Scott. The other new works at Oxford were noticed last year. The Clarendon Laboratory we may, however, mention, is finished. It corresponds in character with the Museum, of which it forms an extension: the lecture and working rooms are considered satisfactory by those who use them. The architect was Mr. T. N. Deane.

As an illustration of the progress of science-teaching in our public schools, we may notice the erection of a convenient laboratory, with spacious lecture hall and class rooms, at Eton. It is of red brick and stone, Gothic in style, and was designed by Mr. W. Wilkinson, of Oxford. At Winchester College a new library has been erected from the designs of Mr. Butterfield, as a memorial of Dr. Moberly, now Bishop of Salisbury, who was head master of the college from 1836 to 1866. The library proper is a noble room 90 feet long and 20 feet wide, except in the centre, where it is widened by bay-windows.

The new Hall of the Inner Temple, London, designed by Mr. S. Smirke, R.A., occupies the site of the old hall, rich in various associations, but is much larger and much more splendid. The character of the exterior will be sufficiently understood from the engraving, which has been drawn with great care from the finished building. The interior is a very handsome and well-proportioned room, 94 feet long, 41 feet wide, and 40 feet high to the wall-plate. The roof, like the wall linings, is of oak, resembling generally that of Westminster Hall, and is very carefully wrought. The building itself is externally of Portland-stone, the interior being lined with fine Bath-stone. The oriel at the upper end of the room is filled with painted glass, as we believe the other windows will eventually be also.

The Charter House Schools, as our readers know, are to be removed to the neighbourhood of Godalming, Surrey, the present school buildings having been purchased for the Merchant Taylors' School. For the new schools a charming site, some sixty acres in extent, has been secured, and the works are advancing under the direction of Mr. P. C. Hardwick. The building will be of great capacity, Gothic in style, and constructed of the local green sandstone, with Bath-stone dressings. We are not greatly impressed with the design as it appears on paper, but abstain from criticism on it till we have seen the building itself.

A new building for Abingdon Grammar School has been erected in Albert Park, from the designs of Mr. E. Dolby, of Abingdon, at a cost of 7000*l*. It is Collegiate Gothic in style, of red brick, with bands, windows, and dressings of Bath-stone. The principal school room is 66 by 20 feet, with a good open timber roof. Sir William Turner's Grammar School, Coatham, near Redcar, is a spacious and ornamental structure, designed by Mr. C. J. Adams, 100 feet long and 50 feet deep, with a tall central tower. It stands by the sea, and might very well have had some local character instead of being that sort of Italian Gothic which architects now think as appropriate in

Hall of the Inner Temple, London.

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Yorkshire or Devonshire, and probably would in Lapland or Seringapatam, as in its native Lombardy. The Ardingley Middle Class Schools, which we have mentioned in previous years, have been opened. The buildings, which are very extensive, affording accommodation for 400 boarders, besides the educational staff, are of an early and somewhat severe Gothic, and constructed of red brick and local sandstone. The architects were Messrs. Slater & Carpenter. Many other schools, and some, though not large, of an ornamental character, have been built in various parts of the country, but our waning space forbids their enumeration. We must, however, just notice in passing, the progress of the first portion of Owens College, Manchester, by Mr. Waterhouse, which will eventually be a very important institution, and a great addition to the architecture of Manchester.

The City Library and Museum has been commenced. It is situated at the back of the Guildhall, and will be a substantial Gothic building, likely to be creditable to the corporation and to the architect, Mr. Horace Jones. The museum, on the ground-floor, will be 83 feet by 64 feet; hardly sufficient, as it seems to us, for such a museum of London antiquities as the City ought to possess and might easily obtain. The library over it will be of the same width, but 15 feet longer, with a reading-room adjoining about 50 feet long. The Bristol Philosophical Institution and Library, a large Gothic building designed by Messrs. Foster and Ponton, is advancing towards completion.

A large and showy Gothic building, bristling with tall narrow arches and taller and steeper gables, has been erected at Keighley, Yorkshire, for the Mechanics' Institute and School of Design. It is of stone, solid in structure, and has cost over 12,000*l*. The architects are Messrs. Lockwood & Mawson. The scheme of the institution is that of a tolerably comprehensive industrial college for adults of both sexes, and a trade-school for boys; and the building is amply provided with class-rooms, in addition to a handsome lecture-hall, exhibition, reading, and conversation rooms. Working Men's Club houses have been built, among other places, at Barrow-in-Furness, a spacious and handsome building, designed by Mr. H. A. Darbishire; and at Madeley, designed by Mr. J. Johnson, and erected as a memorial of Mr. Anstice, a local ironmaster.

New theatres seem much the rage just now in London, but those erected this year, mostly formed by conversion of existing buildings, have architecturally no exterior, and are nearly as flimsy as the performances given in them. One, the Varieties, was opened at Hoxton, but speedily closed. The best perhaps, or at any rate the prettiest inside, is the Vaudeville, in the Strand; but it is marvellous, knowing what is the ordinary and early fate of theatres, that such a place should have been permitted to be constructed in the very midst of closely-packed houses. Seeing what theatres now are, and what the character of their spectacles is, it should at least be a peremptory law that any new theatre should be completely insulated. There seems, however, a strange carelessness with regard to the public safety. Another theatre, the Opera Comique, just completed, at a short distance from the Vaudeville, has an additional source of danger: the theatre is

in Wych Street, the entrance is in the Strand, a passage being carried under Holywell Street, and the pit being sunk considerably below the level of the street. Should a panic occur some night when the theatre is crowded, or should there even be a rush into the house, we might look for a far worse catastrophe than occurred last Christmas at the Bristol Theatre.

6. Street Architecture.

The tendency of our costlier civic architecture continues to be towards excessive decoration. It seems too much as though great commercial establishments were, like rival shopkeepers, trying to outshine each other, and draw attention to themselves, by the expensiveness of their display. A noble building can scarcely be too richly decorated, but the decoration must be good and suitable; be, or seem to be, an essential part of the design, growing out of it and completing it, as the flower does the plant. But ornament, merely as ornament, laid on and not inherent, is as false architecturally as it is erroneous in taste.

Not the worst specimen, but a very striking specimen, of exaggerated decoration, is the Throgmorton Street front of the new Drapers' Hall, and it is the more allowable to adduce it here, as the main building, of which this is, in effect, a screen, is much less exuberant in decoration. The Throgmorton Street front has a length of 170 feet with a height of little over 40 feet, and consists of a series of bold rusticated arches, the keys being carved in high relief and the bays pierced by large windows. Above the windows extends the whole way a frieze of foliage and flowers in very high relief, pendent from alternate lions' and rams' heads, and above this is an elaborate cornice crowned with a blocking-course and balustrade. The entrance in the centre is still more highly enriched, as befits what is necessarily the most important feature of the composition. The grand approach to the hall is immediately within this doorway, but passing by it you enter an open quadrangle of moderate size, surrounded by a cloister, and upon this the fronts of the company's buildings look. These are of different elevations, and, like the screen, Renaissance in character; but their ornament is quieter and far more pleasing, the chief being panels filled with a series of allegorical subjects, very well sculptured by Mr. E. W. Wyon. The reception and court rooms are approached by a vestibule and grand staircase, chiefly of costly marbles and lit by a lofty cupola. The reception rooms form a suite of three, 130 feet long and from 20 to 30 feet wide, and rich in architectural and coloured decoration. Beyond is the hall, the use of which is reserved for livery dinners and other state occasions. Here nothing has been spared that could add to the splendour of the room consistently with its character. The floor is about 82 feet long by 46 feet wide, and 45 feet high, but the space is somewhat encroached on by a series of twenty-eight columns, coupled at the ends of the hall, which are brought out clear of the walls. The hall is semi-circular at the upper end and square at the lower, and has a coved and panelled ceiling, supported by a series of colossal male terminal figures. The columns are monoliths of polished Devonshire marble, with pilasters of similar marble behind them, and standing on

pedestals with plinths of black and gold marble, and capping and base mouldings of Bardilla and green marble, a continuous dado of marble being carried round the hall. The rest of the ornament is of corresponding richness, and no doubt the room will have a very splendid appearance when lit up at a livery dinner.

Fewer City offices have been completed of a noticeable kind than usual, but the builder has been busy about Lombard Street, Gracechurch Street, Throgmorton Street, Cornhill, the Poultry, Wood Street, and elsewhere, and several new buildings of considerable size have been commenced, and two or three completed, in the neighbourhood of the Holborn Viaduct and the New Market approaches. Of those nearly finished, a large shop and warehouse on the south side of Holborn, by the new circus, appears to be unusually rich in detail and very carefully worked out, but it is at present too much hidden by scaffolding to be seen as a whole. Nearly opposite it a large bank is in course of erection.

At Manchester some large warehouses have been built, and, like those which have already given so decided a character to the street architecture of the city, they are generally Italian in style, and marked by solidity of structure and careful finish in the details; but the style is less strictly classic, and here, as elsewhere, polished granite is much in favour. A spacious building, designed by Messrs. Salomons & Jones, for the Manchester Reform Club, is, however, of rather advanced Italian Gothic, with tall roofs, angular turrets, and a liberal display of polished granite and coloured marbles. Another large building of a semi-public character, approaching completion, is the Religious Institute, Corporation Street, designed by Messrs Horton & Bridgford, for the use of the Bible, Tract, and similar societies; a semi-classic structure, more remarkable for solidity than grace.

The chief addition to the street architecture of Liverpool is an immense railway hotel, at the North Western terminus, Lime Street, immediately opposite St. George's Hall; and even that fine building will not dwarf it, either in size or stateliness. The hotel is 390 feet long and 100 feet high, in seven storeys, with bold attic and dormers; and has central and pavilion towers, with tall Mansard-roofs, 160 feet high. It is built of Stourton-stone, with Minevra-stone dressings, and is finished throughout with extreme care. The style is Renaissance, but coloured by that strong feeling which we noticed in Caius College, the work of the same architect, Mr. A. Waterhouse. The building is altogether a magnificent one, and not the less so for the judicious reserve in the way of ornament. The interior, which contains 330 rooms, is of corresponding character, and the library, dining, coffee, and other public rooms, would be worthy of a London Club house. These costly railway hotels continue to be built, though apparently fewer of a merely speculative kind are ventured upon. The Midland Railway Company are erecting new stations at several towns on their lines, but generally they have not hotels connected with them. The Great Western Railway Company are building a large station at Snow Hill, Birmingham, and the North Western Company one at Derby. For the North London Railway several large stations have been built. A spacious hotel, providing 100 bedrooms and handsome

public rooms, Italian in style, has been opened at the terminus of the South Western Railway, Southampton. The Queen's Hotel, Hanley, Staffordshire, is another very large Italian building, very attractive outside and rich and commodious within. The Granville, at Ramsgate, is equally substantial and probably equally commodious, but the outside is sternly Gothic, and with it the interior, down to the chairs and tables, is in the strictest harmony; the whole was designed by Mr. E. W. Pugin.

One of the most remarkable examples of exuberant ornament in provincial street architecture is the Liverpool, London, and Globe Insurance Office, Corn Street, Bristol. The building stands in a narrow street and is of moderate size, the front being only 55 feet wide and 75 feet high, but hardly a square foot of it is plain wall. It is well and solidly built of stone, Italian Renaissance in style, and is divided into three storeys, the basement being rusticated. The centre is brought a little forward, and consists of three windows on each storey, between coupled Corinthian columns on the basement and middle storey, and coupled colossal Caryatides in the upper, and over these an elaborate cornice and pediment filled with allegorical sculpture. The wings, in which are the doorways and a window in each upper storey, are flanked by single columns, and appear weak in contrast with the gorgeous centre. The architect was Mr. B. Gingell, of Bristol. The National Provincial Bank, Waterloo Street, Birmingham, an equally costly but much more sober, and, as we think, more effective, building, has been completed from the designs of Mr. J. Gibson, the architect of the same company's bank, Bishopsgate Street, London. At Market Drayton, a Gothic building, of some architectural character, designed by Messrs. Barker & Ellis, of Manchester, has been erected for the Manchester and Liverpool Banking Company. Leeds, Halifax, Bradford, and other Yorkshire clothing towns are giving evidence of their continued prosperity by erecting large and handsome warehouses, and other commercial premises, but for the present this mere reference to them must suffice.

7. Bridges, Docks, etc.

Having in the last volume noticed the formal opening of Blackfriars Bridge, and described its structure and dimensions, it will be enough to add that the removal of the piles and scaffolding, and its free use for traffic, have shown distinctly its excellence as an engineering work, its fine general proportions, and its convenient arrangement; but its exposure has brought out more distinctly its architectural shortcomings. The ungainliness, as well as purposelessness, of the huge stumpy granite shafts in front of the piers is so palpable, that in pity to themselves as well as to passengers by the Thames or its embankment, the City corporation should hasten to provide the bronze groups which we have been told are to surmount the columns, and thus in some measure disguise their unmeaning obtrusiveness. It is curious how, by trifling with artistic principles and details—which engineers seem to regard as too puerile to waste an hour of serious thought upon—the appearance of a really fine work may be injured. As another instance,

the iron arches of this bridge are panelled, and the lines, by way of lightening their effect, have been picked out with gold, with the result that the arches, instead of seeming to rest upon, or grow out of, the piers, appear to be merely stuck against them, and thus where we look for stability an unpleasant, however deceptive, feeling of fragility is engendered. Still it is a very fine bridge, and if the authorities will only get rid of the present tawdry gilding (or distribute it with a little more judgment), and place some sufficiently ponderous groups of statuary on the piers, we can promise them that at least the popular verdict will be that of the good-natured newspaper writer—"Blackfriars is the noblest bridge that bestrides the Thames."

The vast works for the extension of Chatham Docks are proceeding steadily. They have now been some fourteen years on hand, and of course with an army of over 2000 workmen (free labourers and convicts included) and unbounded mechanical appliances, an immense change has been produced in the appearance of the place, and various basins, graving-docks, storehouses, &c., brought from time to time into use, but at least six or eight years more will be required for the completion of the entire series of operations.

The East and West India Docks have been extended by the construction of a new South Dock, of 33 acres, under the direction of Mr. Hawkshead, C.E. The dock has a great extent of quays, convenient jetties, warehouses, &c., and four pairs of gates; the main lock being 300 feet long, 55 feet wide, and 30 feet deep at high tide.

At Torquay a new harbour has been constructed, at a cost of 60,000*l.*, by Sir L. Palk, the lord of the manor. It promises to be of great service, not only to trading vessels, fishing-boats, and yachts belonging to the port, but also to vessels that may be caught by the severe storms which sweep along this part of the coast. The corporation, aided by a loan of 27,000*l.* from the Commissioners of Public Works, are carrying out extensive operations for the improvement of Yarmouth Harbour.

A new low-water landing pier, 1350 feet long and 34 feet wide, with a pier-head 100 feet wide, has been constructed at Cardiff, at the cost of the Marquis of Bute, and in connection with it a railway station, approaches, and a light-tower 40 feet high. At Blackpool a new promenade and other ornamental works, in connection with the pier, have been constructed from the designs of Mr. E. Birch, at a cost of over 60,000*l.* A pier, which is intended to form a promenade as well as a landing-place, is in course of construction at Eastbourne, from the designs of Mr. E. Birch. It will be 1000 feet long by 22 feet wide, with a pier-head 135 feet wide; and will rest throughout on iron columns fixed in the rock by screw-piles. A moiety of the pier was opened for public use in June last. New piers have also been commenced or projected at Hunstanton and other watering-places: but our enumeration has proceeded far enough to show that throughout the country, and in every department, architectural and engineering improvements are making steady and on the whole satisfactory progress.

JAMES THORNE.

TABLE OF ALL THE PUBLIC GENERAL ACTS OF PARLIAMENT,

PASSED IN THE SECOND SESSION OF THE TWENTIETH PARLIAMENT OF GREAT BRITAIN AND IRELAND,

33 AND 34 VICTORIÆ.

(The Acts are given in the order in which they were passed, the number denoting the chapter. Of those Acts, to the title of which an asterisk is prefixed, an abstract is given in the pages following this table, containing a classified epitome of the more important legislation of the year.)

I. An Act to empower Committees on Bills confirming Provisional Orders to award costs and examine witnesses on oath.
(Applies 21 & 22 Vict. c. 78; Administration of Oaths.
„ 28 & 29 Vict. c. 27; Award of Costs.)

II. An Act to make provision for the proceedings of Boards of Management and Boards of Guardians upon the dissolution of Districts and Unions, or the annexation of Parishes to Unions.
(Applies 4 & 5 Will. 4, c. 76, and 30 & 31 Vict. c. 106; Poor Relief.
„ 32 & 33 Vict. c. 63; Metropolitan Poor.)

III. An Act to make better provision for making laws and regulations or certain parts of India, and for certain other purposes relating thereto.
(Repeals section 49 of 3 & 4 Will. 4, c. 85; Government of India.)

IV. An Act to make provision for the assessment of Income Tax, and to amend the law relating to Inland Revenue.
(Applies existing Acts relating to Income Tax.
„ 32 & 33 Vict. c. 67; Valuation in Metropolis.)

V. An Act to apply certain sums out of the Consolidated Fund to the service of the years ending on the 31st of March, 1869, 1870, and 1871, and preceding years.

VI. An Act to extend the jurisdiction of the Judges of the Superior Courts of Common Law at Westminster.

VII. An Act for punishing Mutiny and Desertion, and for the better payment of the Army and their quarters.
(Applies 26 & 27 Vict. c. 57; Regimental Debts.
Repeals sections 9, 10, of 30 & 31 Vict. c. 34; Army Enlistment.)

VIII. An Act for the regulation of Her Majesty's Royal Marine Forces while on shore.

IX. An Act to amend "The Peace Preservation (Ireland) Act, 1856," and for other purposes relating to the Preservation of Peace in Ireland.
(Amends, and repeals in part, 19 & 20 Vict. c. 36; Peace Preservation in Ireland, and nine other Acts.)

X. An Act to consolidate and amend the law relating to the Coinage and Her Majesty's Mint.
(Applies 11 & 12 Vict. c. 43;
„ 27 & 28 Vict. c. 53; } Summary Procedure.
„ 14 & 15 Vict. c. 93; Petty Sessions in Ireland.)

XI. An Act to enable the officers employed in the Collector-General of Rates office in the city of Dublin to vote at Parliamentary Elections for that city.
(Recites 31 & 32 Vict. c. 73; Revenue Officers' Disabilities Removal.

Repeals section 24 of 12 & 13 Vict. c. 91; Collector of Rates for Dublin.)

XII. An Act to repeal certain duties of Customs in the Isle of Man.

(Repeals in part 18 & 19 Vict. c. 97; Duties on Corn.)

XIII. An Act to amend the law relating to the Surveys of Great Britain, Ireland, and the Isle of Man.

(Applies 6 Geo. 4, c. 99; } Survey of Ireland.
„ 17 & 18 Vict. c. 17; }
„ 4 & 5 Vict. c. 30; Survey of Great Britain.
Repeals 45 Geo. 3, c. 109; Survey of Ireland.
„ 19 & 20 Vict. c. 61; Survey of Great Britain.)

XIV. An Act to amend the law relating to the legal condition of Aliens and British Subjects.

(Applies 31 & 32 Vict. c. 37; Documentary Evidence.
Repeals, with a proviso, Acts in Schedule).

XV. An Act to transfer to the Commissioners of Her Majesty's Works and Public Buildings the property in, and control over, the buildings and property of the County Courts in England, and for other purposes relating thereto.

(Applies 8 & 9 Vict. c. 18; Lands Clauses.
Repeals sections 48, 50–55, of 9 & 10 Vict. c. 95; }
„ sections 8, 9, of 29 & 30 Vict. c. 14; } County Courts.)
„ section 18 of 30 & 31 Vict. c. 142; }

XVI. An Act to define the boundary between the counties of Inverness and Elgin or Moray, in the district of Strathspey; and for other purposes.

(Amends eight local Acts.)

XVII. An Act for making further provision relating to the Management of certain Departments of the War Office.

(Amends 18 & 19 Vict. c. 117; Ordnance Board.
„ 26 & 27 Vict. c. 12; Secretary of State for War.)

*XVIII. An Act to provide for the equal distribution over the Metropolis of a further portion of the charge for the Relief of the Poor.

XIX. An Act to amend "The Railway Companies Powers Act, 1864," and "The Railway Construction Facilities Act, 1864."

XX. An Act to amend "The Mortgage Debenture Act, 1865."

(Amends and repeals in part 28 & 29 Vict. c. 78; Mortgage Debentures.)

XXI. An Act to disfranchise the Boroughs of Bridgwater and Beverley.

XXII. An Act to confirm a certain Provisional Order made under an Act of the fifteenth year of Her present Majesty, to facilitate arrangements for the relief of Turnpike Trusts.

(Confirms Provisional Order made under 14 & 15 Vict. c. 38.)

*XXIII. An Act to abolish Forfeitures for Treason and Felony, and to otherwise amend the Law relating thereto.

XXIV. An Act for making further provision respecting the borrowing of money by the Metropolitan Board of Works.

(Amends 32 & 33 Vict. c. 102; Metropolitan Board of Works.)

XXV. An Act to disfranchise certain Voters of the City of Norwich.

XXVI. An Act to regulate the Sale of Poisons in Ireland.

(Applies 14 & 15 Vict. c. 90; Fines.
„ 14 & 15 Vict. c. 93; Petty Sessions.
Extends 23 & 24 Vict. c. 84; Adulteration of Articles of Food, &c.
Saves 14 & 15 Vict. c. 13; Sale of Arsenic.)

XXVII. An Act for the Protection of Inventions exhibited at International Exhibitions in the United Kingdom.

(Gives rights under "The Patent Law Amendment Act, 1852," and under "The Designs Act, 1850," for protection).

XXVIII. An Act to amend the law relating to the remuneration of Attorneys and Solicitors.

(Amends 6 & 7 Vict. c. 73; Attorneys' Costs.)

XXIX. An Act to amend and continue "The Wine and Beerhouse Act, 1869."

(Amends and continues 32 & 33 Vict. c. 27.
Applies 9 Geo. 4, c. 61, as to Justices' Licenses.
Amends 26 & 27 Vict. c. 33; Beerhouse Retailers' Licenses.
Extends 18 & 19 Vict. c. 118, as to Entry by Constables.
Repeals section 6 of 5 Geo. 4, c. 54; section 2 of 6 Geo. 4, c. 81; and section 6 of 13 & 14 Vict. c. 67, so far as relates to Brewers' Retail Licenses.)

XXX. An Act to abolish Attachment of Wages.

XXXI. An Act to apply the sum of 9,000,000*l.* out of the Consolidated Fund to the service of the year ending the 31st of March, 1871.

*XXXII. An Act to grant certain Duties of Customs and Inland Revenue, and to repeal and alter other Duties of Customs and Inland Revenue.

XXXIII. An Act to amend the Acts relating to the Export of Unseasonable Salmon.

(Amends section 3 of 26 & 27 Vict. c. 10; Salmon Acts Amendment.
„ section 65 of 28 & 29 Vict. c. 121; Salmon Fishery.)

*XXXIV. An Act to amend the law as to the Investment on Real Securities of Trust Funds held for Public and Charitable purposes.

*XXXV. An Act for the better Apportionment of Rents and other Periodical Payments.

XXXVI. An Act to amend "The Cattle Disease Act (Ireland), 1866."

(Amends 29 & 30 Vict. c. 4.)

XXXVII. An Act to enable the senior Magistrate of populous places in Scotland to act ex officio as a Justice of the Peace and Commissioner of Supply for the County in which the said populous place is situated.

(Amends 25 & 26 Vict. c. 101; Police of Towns in Scotland.)

XXXVIII. An Act to disfranchise the Boroughs of Sligo and Cashel.

XXXIX. An Act to facilitate transfers of Ecclesiastical Patronage in certain cases.

(Explains Ecclesiastical Commissioners Acts, 3 & 4 Vict. c. 113, s. 73; 4 & 5 Vict. c. 39, s. 22; and 31 & 32 Vict. c. 114, s. 12.)

XL. An Act for authorizing a guarantee of a Loan to be raised by the Government of New Zealand for the construction of Roads, Bridges, and Communications in that country, and for the introduction of Settlers into that country.

XLI. An Act for raising the sum of 1,300,000*l.* by Exchequer Bonds for the service of the year ending on the 31st of March, 1871.

XLII. An Act to empower Magistrates and Town Councils of burghs in Scotland to abolish Petty Customs and to levy a rate in lieu thereof.

XLIII. An Act to alter certain duties of Customs upon Refined Sugar in the Isle of Man.

(Repeals in part 29 & 30 Vict. c. 23; Customs in the Isle of Man.)

XLIV. An Act to declare the Stamp Duty chargeable on certain Leases.

(Construction of section 16 of 17 & 18 Vict. 83, as to additional duty on certain Leases.)

XLV. An Act for establishing a District Registrar of the High Court of Admiralty in England at Liverpool.

*XLVI. An Act to amend the law relating to the Occupation and Ownership of Land in Ireland.

XLVII. An Act for extending to Ireland and amending "The Dividends and Stock Act, 1869."

(Amends, and extends to Ireland, 32 & 33 Vict. c. 104, and other provisions made by 33 & 34 Vict. c. 71; National Debt.)

*XLVIII. An Act for removing doubts respecting the payment of expenses incurred in the Conveyance of Paupers in certain cases not expressly provided for by law.

*XLIX. An Act to explain and amend "The Evidence Further Amendment Act, 1869."

L. An Act to amend "The Shipping Dues Exemption Act, 1867."

(Amends 30 & 31 Vict. c. 15, as to Agreements for Compensation.

(Repeals 32 & 33 Vict. c. 52; Shipping Dues Exemption Act, 1869.)

LI. An Act to repeal an Act intituled "An Act to alter the mode of giving notices for the holding of Vestries, of making Proclamation in cases of Outlawry, and of giving notices on Sundays in respect to various matters," so far as such Act relates to the Isle of Man.

(Repeals, so far as respects the Isle of Man, 7 Will. 4, and 1 Vict. c. 45.)

*LII. An Act for amending the law relating to the Extradition of Criminals.

LIII. An Act to amend certain provisions in the Sanitary and Sewage Utilization Acts.

(Amends 29 & 30 Vict. c. 90; Sanitary Acts, 1866.
„ 30 & 31 Vict. c. 113; Sewage Utilization.
Extends 58 Geo. 3, c. 69; Parish Vestries.)

LIV. An Act to disfranchise certain Voters of the City of Dublin.

(Recites 32 & 33 Vict. c. 65; Dublin Freemen's Commission.)

LV. An Act to vest Jurisdiction in matters arising within the Dominions of the Kings of Siam in the Supreme Court of the Straits Settlements.

(Explains 20 & 21 Vict. c. 75; Jurisdiction in Siam.)

LVI. An Act to enable the owners of settled Estates in England and Ireland to charge such estates, within certain limits, with the expense of building mansions as residences for themselves.

(Applies 27 & 28 Vict. c. 114; Improvement of Land.)

*LVII. An Act to grant a duty of Excise on Licenses to use Guns.

*LVIII. An Act to further amend the law relating to Indictable Offences by Forgery.

LIX. An Act to render valid certain Contracts informally executed in India.

(Amends 22 & 23 Vict. c. 41; Government of India, as to execution of certain Contracts.)

*LX. An Act to relieve the Brokers of the City of London from the supervision of the Court of Mayor and Aldermen of the said City.

*LXI. An Act to amend the law relating to Life Assurance Companies.

*LXII. An Act to amend and extend the Acts relating to Factories and Workshops.

LXIII. An Act to limit Wages Arrestment in Scotland.

(Amends 7 Will. 4, and 1 Vict. c. 41; Small Debts.)

LXIV. An Act to amend the Petty Sessions Clerk (Ireland) Act, 1858.

(Amends 21 & 22 Vict. c. 100; Petty Sessions Clerk.)

LXV. An Act to amend the law relating to Advertisements respecting Stolen Goods.

(Amends section 102 of 24 & 25 Vict. c. 96; Larceny Consolidation.)

LXVI. An Act to make further provision for the Government of British Columbia.

(Amends 21 & 22 Vict. c. 99, and 29 & 30 Vict. c. 67; British Columbia Government.)

*LXVII. An Act to shorten the time of Active Service in the Army, and to amend in certain respects the law of Enlistment.

*LXVIII. An Act to amend the Acts relating to the Militia of the United Kingdom.

LXIX. An Act for further promoting the revision of the Statute Law by repealing certain enactments that have ceased to be in force or are consolidated by certain Acts of the present Session.

(Repeals, with a proviso, the Enactments relating to the National Debt and to Forgery, as described in the Schedules.)

LXX. An Act to facilitate in certain cases the obtaining of powers for the construction of Gas and Waterworks, and for the supply of Gas and Water.

(Applies Lands Clauses Acts, 1845 and 1860.
„ Gasworks Clauses Act, 1847.
„ Waterworks Clauses Acts, 1847 and 1863.
„ 7 Will. 4 and 1 Vict. c. 83; Custody of Documents by Clerks of the Peace.)

LXXI. An Act for consolidating, with amendments, certain enactments relating to the National Debt.

LXXII. An Act for granting Certificates to Pedlars.

(Applies 11 & 12 Vict. c. 43, and 27 & 28 Vict. c. 53; Summary Procedure.
Applies 14 & 15 Vict. c. 93; Petty Sessions.)

LXXIII. An Act to continue certain Turnpike Acts in Great Britain, to repeal certain other Turnpike Acts, and to make further provision concerning Turnpike Roads.

(Repeals and continues Acts as in Schedule.
Amends 31 & 32 Vict. c. 99.)

LXXIV. An Act to confirm the Award under "The Curragh of Kildare Act, 1868," and for other purposes relating thereto.

(Award under 31 & 32 Vict. c. 60, confirmed.)

*LXXV. An Act to provide for public Elementary Education in England and Wales.

*LXXVI. An Act to facilitate the Arrest of Absconding Debtors.

*LXXVII. An Act to amend the laws relating to the qualifications, summoning, attendance, and remuneration of Special and Common Juries.

LXXVIII. An Act to facilitate the construction and to regulate the working of Tramways.

(Applies Lands Clauses Act, 1845.

Applies Commissioners Clauses Act, 1847.
„ Metropolis Board of Works (Loans), 1869.
„ 7 Wm. 4 & 1 Vict. c. 83; Custody of Documents by Clerks of Peace.
„ 11 & 12 Vict. c. 43; Summary Procedure.)

*LXXIX. An Act for further regulation of Duties of Postage, and for other purposes relating to the Post Office.

*LXXX. An Act for taking the Census of Ireland.

LXXXI. An Act to amend the Acts of 37 Geo. 3, c. 127, and 39 & 40 Geo. 3, c. 14.

LXXXII. An Act to authorize the Commissioners of Her Majesty's Treasury to guarantee the payment of a loan to be raised by the Government of Canada for the construction of fortifications in that country.

LXXXIII. An Act to make better provision for the Police Force in the City of Londonderry, and to amend the Acts relating to the Royal Irish Constabulary Force.

(Amends 28 & 29 Vict. c. 70, and 29 & 30 Vict. c. 103, regarding the Constabulary of Ireland.)

*LXXXIV. An Act to amend the Public Schools Act, 1868.

LXXXV. An Act to declare the hundred in which a piece of land in the County of Norfolk is situate, and to provide for the assessment of the said piece of land to the county rate.

(Applies 15 & 16 Vict. c. 81; County Rates Assessment.)

LXXXVI. An Act to amend and extend the Act 16 & 17 Vict. c. 92, to make further provision for uniting counties in Scotland in so far as regards the jurisdiction of the Sheriff; and also to make certain provisions regarding the duties of Sheriffs and Sheriffs' Substitute in Scotland.

(Amends and extends 16 & 17 Vict. c. 92; Sheriffs, Scotland.
Repeals in part 1 & 2 Vict. c. 119; Sheriffs, Scotland.)

LXXXVII. An Act to amend the Act 23 & 24 Vict. c. 50, intituled "An Act to abolish the Annuity Tax in Edinburgh and Montrose, and to make provision in regard to the stipends of the ministers in that city and burgh, and also to make provision for the patronage of the church of North Leith;" and to make provision for the abolition of the Annuity Tax within the parish of Canongate, and for the payment of the minister of said parish.

(Amends and repeals in part 23 & 24 Vict. c. 50.
„ „ „ 30 & 31 Vict. c. 107; Annuity Tax, &c.
Amends 1 & 2 Vict. c. 55; Leith Dock Commissioners.
Applies Commissioners Clauses Act, 1847.)

LXXXVIII. An Act to extend the Telegraph Acts of 1868, 1869, to the Channel Islands and the Isle of Man.

(Amends and extends 31 & 32 Vict. c. 110 / 32 & 33 Vict. c. 73 } Telegraphs.)

LXXXIX. An Act to enable the Governors of Queen Anne's Bounty to provide superannuation allowances to their officers.

*XC. An Act to regulate the conduct of Her Majesty's subjects during the existence of hostilities between foreign states with which Her Majesty is at peace.

*XCI. An Act for the relief of persons admitted to the office of Priest or Deacon in the Church of England.

XCII. An Act to amend the laws for the election of the Magistrates and Councillors of Royal and Parliamentary Burghs in Scotland.

(Amends four Acts relating to Municipal Elections and Registrations.)

*XCIII. An Act to amend the law relating to the Property of Married Women.

XCIV. An Act to provide for superannuation allowances to Medical Officers of Unions, Districts, and Parishes in England and Wales.

(Applies 27 & 28 Vict. c. 42; Superannuation of Officers of Unions.)

*XCV. An Act to authorize the carriage of Naval and Military Stores in Passenger Ships.

XCVI. An Act to apply a sum out of the Consolidated Fund to the service of the year ending the 31st of March, 1871, and to appropriate the supplies granted in this Session of Parliament.

XCVII. An Act for granting certain Stamp Duties in lieu of duties of the same kind now payable under various Acts, and consolidating and amending provisions relating thereto.

*XCVIII. An Act for consolidating and amending the law relating to the management of Stamp Duties.

XCIX. An Act for the repeal of certain enactments relating to the Inland Revenue.

(Repeals, with a proviso, a number of enactments given in Schedule.)

C. An Act to amend the law relating to the repayment to the Consolidated Fund of money expended for the benefit of Greenwich Hospital.

(Repeals section 51 of Greenwich Hospital Act, 1865; 28 & 29 Vict. c. 89.)

CI. An Act for amending the 6th section of the Pensions Commutation Act, 1869.

(Amends section 6 of 32 & 33 Vict. c. 32.)

CII. An Act to amend the law relating to the taking of Oaths of Allegiance on Naturalization.

(Amends 33 & 34 Vict. c. 14, as to the taking of Oaths of Allegiance.)

CIII. An Act to continue various expiring laws.

(Continues thirty-three Acts, from 5 & 6 Will. 4, c. 27, to 32 & 33 Vict. c. 61, as follows:—

5 & 6 Will. 4, c. 27; Linen, &c., Manufactures (Ireland).
2 & 3 Vict. c. 74; Societies, unlawful (Ireland).
3 & 4 Vict. c. 89; Poor Rates (Stock in Trade).
4 & 5 Vict. c. 30; Survey of Great Britain.
4 & 5 Vict. c. 59; Application of Highway Rates.
5 & 6 Vict. c. 123; Lunatic Asylums (Ireland).
10 & 11 Vict. c. 32; Landed Property Improvement (Ireland).
10 & 11 Vict. c. 90; Poor Laws (Ireland).
10 & 11 Vict. c. 98; Ecclesiastical Jurisdiction.
11 & 12 Vict. c. 32; County Cess (Ireland).
11 & 12 Vict. c. 107; Sheep and Cattle Diseases.
14 & 15 Vict. c. 104; Episcopal, &c., Estates.
17 & 18 Vict. c. 102; Corrupt Practices Prevention.
17 & 18 Vict. c. 117; Incumbered Estates (West Indies).
19 & 20 Vict. c. 36; Preservation of the Peace (Ireland).
23 & 24 Vict. c. 19; Dwellings for Labouring Classes (Ireland).
24 & 25 Vict. c. 109; Salmon Fishery (England).
25 & 26 Vict. c. 97; Salmon Fisheries (Scotland).
26 & 27 Vict. c. 105; Promissory Notes.
27 & 28 Vict. c. 20; Promissory Notes, &c. (Ireland).
27 & 28 Vict. c. 9; Malt for Animals.

27 & 28 Vict. c. 92; Public Schools.
28 & 29 Vict. c. 46; Militia Ballots Suspension.
28 & 29 Vict. c. 66; Malt Duty.
28 & 29 Vict. c. 83; Locomotives on Roads.
28 & 29 Vict. c. 121; Salmon Fishery.
29 & 30 Vict. c. 52; Prosecution Expenses.
30 & 31 Vict. c. 126; Railway Companies (Scotland).
30 & 31 Vict. c. 127; Railway Companies.
30 & 31 Vict. c. 141; Master and Servant.
31 & 32 Vict. c. 32; Endowed Schools.
31 & 32 Vict. c. 76; Militia Pay.
32 & 33 Vict. c. 61; Trades Union Funds.)

*CIV. An Act to facilitate compromises and arrangements between creditors and shareholders of Joint Stock and other Companies in Liquidation.

CV. An Act for appointing a Commission to inquire into the alleged prevalence of the Truck System, and the disregard of the Acts of Parliament prohibiting such system, and for giving such Commission the powers necessary for conducting such inquiry.

(Appoints Commissioners to inquire into offences against the Truck Act, 1 & 2 Will. 4, c. 37.)

CVI. An Act to amend the Sanitary Act, 1866, so far as relates to the City of Dublin.

(Amends 29 & 30 Vict. c. 90, so far as relates to Dublin.)

*CVII. An Act for taking the Census of England.

*CVIII. An Act for taking the Census in Scotland.

CIX. An Act to abolish certain Real Actions in the Superior Courts of Common Law in Ireland, and further to amend the procedure in the said Courts; and for other purposes.

(Amends 16 & 17 Vict. c. 113, as to abolition of certain Real Actions, &c.)

CX. An Act to provide for the administration of the law relating to Matrimonial Causes and Matters, and to amend the law relating to Marriages in Ireland.

(Explains section 45 of Irish Church Act, 32 & 33 Vict. c. 42.
Applies sections 105–107 of 20 & 21 Vict. c. 79; Probates, &c.
Amends and applies 7 & 8 Vict. c. 81, and 26 & 27 Vict. c. 27.
Repeals so much of 19 Geo. 2, c. 13 (1) as respects marriage between a Protestant and a Roman Catholic when celebrated by a Roman Catholic priest.)

CXI. An Act to make provision in relation to certain Beerhouses not duly qualified according to law.

(Explains, &c., 3 & 4 Vict. c. 61, as to Licences for certain Beerhouses.)

CXII. An Act to amend the Act of 1 & 2 Will. 4, c. 33, in part, and to afford facilities for obtaining loans for the erection, enlargement, and improvement of Glebe Houses, and for the acquirement of lands for Glebes in Ireland.

(Amends and in part repeals 1 & 2 Will. 4, c. 33, as to Loans from Commissioners of Public Works.)

ABSTRACTS OF IMPORTANT ACTS OF PARLIAMENT

PASSED IN THE SECOND SESSION OF THE TWENTIETH PARLIAMENT OF GREAT BRITAIN AND IRELAND.

1. ARMY AND NAVY.

ARMY RECRUITMENT.

[33 and 34 Victoriæ, cap. 67.—August 9, 1870.]

An Act to shorten the Time of Active Service in the Army, and to amend in certain respects the Law of Enlistment.

Under the terms of this Act, which has twenty-two clauses, the period of service in the British army is shortened, under certain conditions. A recruit has the choice of enlisting either for "long service," or for "short service." As regards the "long service," he may enlist for twelve years in the regular army, at the end of which, if he has conducted himself well and is allowed by his commanding officer, he may re-engage for nine years more to complete a service of twenty-one years. On his discharge, after completing the twenty-one years, he will receive a pension for life. As regards "short service," a recruit may enlist for six years in the regular army, and six years in the first-class reserve. After the first six years are passed he will be able to return to civil life, to live wherever he likes within the United Kingdom, and to follow any trade or occupation he pleases. During the last six years he will receive the pay of 4*d.* a day, in return for which he will be liable to be drilled occasionally, but the Act provides that the times shall be so arranged as to interfere as little as possible with his ordinary trade or occupation. He will also be liable, in case of imminent national danger or of great emergency, to be recalled to service with that branch of the regular army in which he has previously served. If during the second six years an emergency occurs and he is recalled to the service, he will receive the full daily pay of a soldier, and his reserve service will reckon towards good-conduct pay, the same as if he had served continuously in the army, and if at the end of his limited engagement he re-engages, his reserve service will count year for year towards pension on discharge. All future enlistments are to be for general service, and the recruit may be posted to any regiment or corps, unless the Secretary of State shall, by regulations, permit enlistment for particular regiments. A soldier attached to a regiment may be transferred by the military authorities to another if he has been invalided from foreign service, or if his regiment being ordered on foreign service, he is unfit for such service, or is within two years of the termination of the period of his army service. A soldier abroad when his period of service expires may be detained for not more than twelve months, and is then to be sent home at the public charge, unless, being in a British colony, he desires to remain there. The number of men serving in the militia reserve and in the army reserve first class is not to exceed 60,000 in the whole.

FOREIGN ENLISTMENT.

[33 and 34 Victoriæ, cap. 90.—August 9, 1870.]

An Act to regulate the Conduct of Her Majesty's Subjects during the Existence of Hostilities between Foreign States with which Her Majesty is at peace.

This Act has thirty-three clauses, with a preamble reciting that "it is expedient to make provision for the regulation of the conduct of Her Majesty's subjects during the existence of hostilities between foreign states with which Her Majesty is at peace." By the fourth section of the Act, penalties of fine and imprisonment are threatened against all persons accepting "commissions or engagements in the military or naval service of any foreign state at war with any foreign state at peace with Her Majesty;" and by the next section the same penalties are held out for "going on board any ship with a view of quitting Her Majesty's dominions, with intent to accept any commission or engagement." Illegal shipbuilding is the next subject, clause 8 enacting "penalties of fine and imprisonment against all persons building, equipping, or despatching war ships, or fitting out naval or military expeditions." Powers are given to various officers to seize offending ships. There is also power given to detain a ship if the Secretary of State or the chief executive authority is satisfied that there is a reasonable and probable cause for believing that a ship within Her Majesty's dominions has been, or is being, built, or equipped contrary to this Act, and is about to be taken beyond the limits of such dominions, or that a ship is about to be despatched contrary to this Act; an indemnity is to be allowed by the Treasury if the Court of Admiralty shall find that there was not reasonable and probable cause for the detention. The Act repeals the "Foreign Enlistment Act" of 56 Geo. III., c. 69. It is declared that the Act will not subject to forfeiture a commissioned ship of a foreign State.

MILITIA EMBODIMENT.

[33 and 34 Victoriæ, cap. 68.—August 9, 1870.]

An Act to amend the Acts relating to the Militia of the United Kingdom.

The preamble of this Act, which is very short, containing only two clauses, recites that "whereas under the Acts in force concerning the Militia of the United Kingdom, the Militia can be drawn out and embodied in England and Scotland respectively only in case of actual invasion or of imminent danger of invasion, or in case of rebellion or insurrection, or in case of a state of war existing between Her Majesty and a foreign power; and in Ireland only in case of actual invasion, rebellion, or insurrection, or of immediate danger thereof, or in case of a state of war existing between Her Majesty and a foreign power," and that it is "expedient to amend the aforesaid Acts." Consequently, it is enacted, clause 1, that "in case of imminent national danger, or of great emergency, the occasion being first communicated to Parliament, if Parliament be then sitting, or declared by proclamation in pursuance of an Order of Her Majesty in Council if Parliament be not then sitting, it shall be lawful for Her Majesty and for the Lord Lieutenant, or other chief governor or governors of Ireland respectively, to cause the whole or any part of the respective Militias of England, Scotland, and Ireland to be drawn out and embodied, or to cause additional Militia to be raised for England, Scotland, or Ireland." And it is further ordered, clause 2, that "whenever in pursuance of the provision of this Act, Her Majesty

causes any Militia to be drawn out, embodied, or raised as aforesaid, if Parliament be then separated by such adjournment or prorogation as will not expire within ten days, a proclamation shall be issued for the meeting of Parliament within ten days."

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2. CHURCH AND EDUCATION.

CLERICAL DISABILITIES.

[33 and 34 Victoriæ, cap. 91.—August 9, 1870.]

An Act for the Relief of Persons admitted to the Office of Priest or Deacon in the Church of England.

This Act contains eight clauses. The first and second define the terms "minister," "Bishop," "diocese," and "preferment," and provide that the Act itself may be cited as "The Clerical Disabilities Act, 1870." The third clause recites that any "minister of the Church of England," after having resigned his preferment, "may" execute a deed of relinquishment, which he "may" cause to be enrolled in the Court of Chancery, delivering a copy of the same to the Bishop in whose diocese he holds preferment or resides, and give notice of the same to the Archbishop of the province. By the fourth clause it is provided that at the end of six months such Bishop "shall," on application, cause the deed to be recorded in the registry of the diocese; and a copy of such record is, by clause 7, to be given to the clergyman executing such deed on payment of a fee not exceeding 10*s*. Clauses 5 and 6 provide that, if, within the above-mentioned six months, any legal proceeding shall be taken against such clergyman, the said deed shall be recorded "at the termination of those proceedings by a definitive sentence and its execution, but not sooner," and that nothing in the Act shall relieve the said clergyman from any liability in respect of dilapidations, &c. By the fourth section of the Act it is recited that, on the completion of the above-mentioned formalities, the following consequences shall ensue with respect to the person signing and executing such deed:—"1. He shall be incapable of officiating or acting in any manner as a minister of the Church of England, and of taking or holding any preferment therein, and shall cease to enjoy all rights, privileges, advantages, and exemptions attached to the office of minister in the Church of England. 2. Every licence, office, and place held by him for which it is by law an indispensable qualification that the holder thereof should be a minister of the Church of England shall be *ipso facto* determined and void; and lastly, 3. He shall be by virtue of this Act discharged and free from all disabilities, disqualifications, restraints, and prohibitions to which if this Act had not been passed, he would by force of any of the enactments mentioned in the first schedule to this Act or of any other law, have been subject as a person who had been admitted to the office of minister in the Church of England, and from all jurisdiction, penalties, censures, and proceedings to which, if this Act had not been passed, he would or might, under any of the same enactments or any other law have been amenable or liable in consequence of his having been so admitted and of any act or thing done or omitted by him after such admission." The form of the "deed of relinquishment" is as follows:—"Know all men by these presents, that I, A. B., of , having been admitted to the office of priest (or deacon, as the case may be) in the Church of England, and having resigned (here to be inserted description of late preferment, if any), do hereby, in pursuance of the

"Clerical Disabilities Act, 1870," declare that I relinquish all rights, privileges, advantages, and exemptions of the office as by law belonging to it. In witness whereof, I have hereunto set my hand and seal, this day of , 187 . (Signed) A. B. (L.S.) Executed by A. B. in presence of C. D., of (here follow the address and description of witness.)"

ELEMENTARY EDUCATION.

[33 and 34 Victoriæ, cap. 75.—August 9, 1870.]

An Act to provide for Public Elementary Education in England and Wales.

This important Act contains 100 clauses, with five schedules annexed, and, as published, fills forty-six folio pages. The first four are preliminary clauses, defining the meaning of many terms used, such as "metropolis," "borough," "parish," and so forth, providing also that the Act be cited as "The Elementary Education Act, 1870," and that it "shall not extend to Scotland or Ireland." The next three sections of the Act relate to the supply of schools. Clause 5 orders that "there shall be provided for every school district a sufficient amount of accommodation in public elementary schools (as hereinafter defined) available for all the children resident in such district for whose elementary education efficient and suitable provision is not otherwise made, and where there is an insufficient amount of such accommodation." Clause 6 enacts that "where the Education Department, in the manner provided by this Act, are satisfied, and have given public notice that there is an insufficient amount of public school accommodation for any school district, and the deficiency is not supplied as hereinafter required, a school board shall be formed for such district and shall supply such deficiency, and in case of default by the school board, the Education Department shall cause the duty of such board to be performed in manner provided by this Act." Far-bearing is the next clause, No. 7, running as follows:—"Every elementary school which is conducted in accordance with the following regulations shall be a public elementary school within the meaning of this Act; and every public elementary school shall be conducted in accordance with the following regulations, namely, first, it shall not be required, as a condition of any child being admitted into or continuing in the school, that he shall attend or abstain from attending any Sunday-school, or any place of religious worship, or that he shall attend any religious observance or any instruction in religious subjects in the school or elsewhere, from which observance or instruction he may be withdrawn by his parent, or that he shall, if withdrawn by his parent, attend the school on any day exclusively set apart for religious observance by the religious body to which his parent belongs; secondly, the time or times during which any religious observance is practised, or instruction in religious subjects is given at any meeting of the school, shall be either at the beginning or at the end, or at the beginning and the end of such meeting, and shall be inserted in a time-table to be approved by the Education Department, and to be kept permanently and conspicuously affixed in every school-room; and any scholar may be withdrawn by his parent from such observance or instruction without forfeiting any of the other benefits of the school; thirdly, the school shall be open at all times to the inspection of any of Her Majesty's inspectors, so, however, that it shall be no part of the duties of such inspector to inquire into any instruction in religious subjects given at such school, or to examine any scholar therein in religious

knowledge, or in any religious subject or book; and, fourthly, the school shall be conducted in accordance with the conditions required to be fulfilled by an elementary school in order to obtain an annual parliamentary grant."

Enactments as to the proceedings for the supply of schools fill the next six clauses. It is ordered that the Education Department of the Privy Council shall procure returns as to the number and description of public schools in existence throughout England, and where there is a deficiency in any district, take steps to remedy it, in the first instance by causing "a school board to be formed," with the imposed duty of "supplying the public school accommodation mentioned in the requisition." The Education Department is further empowered to take proceedings in case the appointed school board should make default in its duties, and if, after the lapse of a certain period, not longer than a year, no local agency can be brought to work, to "consider whether any and what public school accommodation is required in such district."

The next eleven sections of the Act, 14 to 24, prescribe the management and maintenance of schools by the school boards. Clause 14 enacts that "every school provided by a school board shall be conducted under the control and management of such board in accordance with the following regulations:—First, the school shall be a public elementary school within the meaning of this Act; second, no religious catechism or religious formulary which is distinctive of any particular denomination shall be taught in the school." In the next two clauses, 15 and 16, school boards are authorized to delegate their authority, "except the power of raising money," to a body of managers, consisting of not less than three persons, but under the supervision of the Education Department, "whose decision shall be final." As to the fees of children in the newly-constituted schools, clause 17 enacts as follows:—"Every child attending a school provided by any school board shall pay such weekly fee as may be prescribed by the school board, with the consent of the Education Department, but the school board may from time to time, for a renewable period not exceeding six months, remit the whole or any part of such fee in the case of any child when they are of opinion that the parent of such child is unable from poverty to pay the same, but such remission shall not be deemed to be parochial relief given to such parent." Further regulations as to the maintenance and erection of schools, including compulsory purchase of sites under the Lands Clauses Consolidation Acts, are given to the school boards in the next sections, one of which provides how the costs shall be defrayed. It is enacted in the 8th division of clause 20 that "all costs, charges, and expenses incurred by the Education Department in relation to any order under this section shall, to such amount as the Commissioners of Her Majesty's Treasury think proper to direct, and all costs, charges, and expenses of any person which shall be so allowed by the Education Department as aforesaid, shall become a charge upon the school fund of the district to which such order relates, and be repaid to the said Commissioners of Her Majesty's Treasury or to such person respectively, by annual instalments not exceeding five, together with interest after the yearly rate of 5*l.* in the 100*l.*"

The four clauses, 25 to 28, give to the school boards notable powers as to the payment of school fees, and the establishment of ordinary free schools, as well as of industrial schools. Clause 25 enacts that "the school board may, if they think fit, from time to time, for a renewable period not exceeding six months, pay the whole or any part of the

school fees payable at any public elementary school by any child resident in their district whose parent is in their opinion unable from poverty to pay the same; but no such payment shall be made or refused on condition of the child attending any public elementary school other than such as may be selected by the parent; and such payment shall not be deemed to be parochial relief given to such parent." The following clause, 26, orders, that "if a school board satisfy the Education Department that, on the ground of the poverty of the inhabitants of any place in their district, it is expedient for the interests of education to provide a school at which no fees shall be required from the scholars, the board may, subject to such rules and conditions as the Education Department may prescribe, provide such school, and may admit scholars to such school without requiring any fee." It is further enacted, clause 27, that "a school board shall have the same powers of contributing money in the case of an industrial school as is given to a prison authority by section 12 of 'The Industrial Schools Act, 1866;' and upon the election of a school board in a borough the council of that borough shall cease to have power to contribute under that section." Lastly, clause 28 provides that "a school board may, with the consent of the Education Department, establish, build, and maintain a certified industrial school within the meaning of the Industrial Schools Act, 1866, and shall for that purpose have the same powers as they have for the purpose of providing sufficient school accommodation for their district."

As regards the constitution and mode of formation of the new agency for the spread of education, the school board, the Act prescribes, under clause 30 to 36, that "the school board shall be a body corporate, by the name of the district to which they belong, having a perpetual succession and a common seal, with power to acquire and hold land without any licence in mortmain." Furthermore, it is enacted that "the number of members of a school board shall be not less than five nor more than fifteen, as may be determined in the first instance by the Education Department, and afterwards from time to time by a resolution of the school board approved by the Education Department;" and also that the same department "may, at any time after the date at which they are authorized under this Act to cause a school board to be formed, and send a requisition to the mayor or other officer or officers who have power to take proceedings for holding the election."

The rules as to the elections of school boards do not apply to the metropolis, an exception in its behalf being made by clauses 37 to 39 of the Act, and schedule number 5. The latter divides the metropolis into ten school districts, namely, the City, Marylebone, Finsbury, Lambeth, Tower Hamlets, Hackney, Westminster, Southwark, Chelsea, and Greenwich, the boundaries of which are to be drawn by the Education Department, which also has to fix "the number of members to be elected by each such division." It is enacted by clause 37, that "the first election of the school board shall take place on such day, as soon as may be after the passing of this Act, as the Education Department may appoint, and subsequent elections shall take place in the month of November every third year on the day from time to time appointed by the school board." The same clause orders that "at every election for each division every voter shall be entitled to a number of votes equal to the number of the members of the school board to be elected for such division, and may give all such votes to one candidate, or may distribute them among the candidates, as he thinks fit;" and that "the members of the board shall, in the city of London, be elected

by the same persons and in like manner as common councilmen are elected, and in the other divisions of the metropolis shall be elected by the same persons and in the same manner as vestrymen under The Metropolis Management Act, 1855, and the Acts amending the same."

The next twenty clauses of the Act, 53 to 73, refer to details, with the exception of the sections headed "Expenses," and "Returns and Inquiry." As to the former, clauses 53 and 54 enact as follows:—"The expenses of the school board under this Act shall be paid out of a fund called the school fund. There shall be carried to the school fund all moneys received as fees from scholars, or out of moneys provided by Parliament, or raised by way of loan, or in any manner whatever received by the school board. Any sum required to meet any deficiency in the school fund, whether for satisfying past or future liabilities, shall be paid by the rating authority out of the local rate. The school board may serve their precept on the rating authority, requiring such authority to pay the amount specified therein to the treasurer of the school board out of the local rate. If the rating authority have no moneys in their hands in respect of the local rate, they shall, notwithstanding any limit under any Act of Parliament or otherwise, levy the said rate, or any contributions thereto, or any increase of the said rate or contributions, and for that purpose shall have the same powers of levying a rate and requiring contributions as they have for the purpose of defraying expenses to which the local rate is ordinarily applicable." As regards the section "Returns and Inquiry," the Act directs that "on or before the 1st of January, 1871, or in the case of the metropolis before the expiration of four months from the date of the election of the chairman of the school board, every local authority, whenever required, but not oftener than once in every year, shall send to the Education Department a return containing such particulars with respect to the elementary schools and children requiring elementary education in their district as the Education Department may from time to time require." It is further enacted, under clauses 68 and 69, that "for the purpose of obtaining such returns the Education Department shall draw up forms, and supply to the local authority such number of forms as may be required; and the managers or principal teacher of every school required to be included in any such return shall fill up the form, and return the same to the local authority within the time specified in that behalf in the form. The returns shall be made in the metropolis by the school board appointed under this Act, in boroughs by the council, and in every parish not situated in a borough or the metropolis by persons appointed for the purpose or by the overseers of such parish. Where a school board is formed under this Act, the returns shall be made by such school board within their district."

Various directions as to how a "public inquiry" shall be held in case the provisions of the law should not be fully carried out in any districts are given in clause 73, which is followed by one of the most notable sections of the Act, headed "Attendance at School." This, clause 74, runs as follows: "Every school board may from time to time, with the approval of the Education Department, make byelaws for all or any of the following purposes: (1.) Requiring the parents of children of such age, not less than 5 years nor more than 13 years, as may be fixed by the byelaws, to cause such children (unless there is some reasonable excuse) to attend school; (2.) Determining the time during which children are so to attend school; provided that no such byelaw shall prevent the withdrawal of any child from any religious observance

or instruction in religious subjects, or shall require any child to attend school on any day exclusively set apart for religious observance by the religious body to which his parent belongs, or shall be contrary to anything contained in any Act for regulating the education of children employed in labour; (3.) Providing for the remission or payment of the whole or any part of the fees of any child, where the parent satisfies the school board that he is unable from poverty to pay the same; (4.) Imposing penalties for the breach of any byelaws; (5.) Revoking or altering any byelaw previously made. Provided that any byelaw under this section requiring a child between 10 and 13 years of age to attend school shall provide for the total or partial exemption of such child from the obligation to attend school if one of Her Majesty's inspectors certifies that such child has reached a standard of education specified in such byelaw. Any of the following reasons shall be a reasonable excuse, namely, (1.) That the child is under efficient instruction in some other manner; (2.) That the child has been prevented from attending school by sickness or any unavoidable cause; (3.) That there is no public elementary school open which the child can attend within such distance, not exceeding three miles, measured according to the nearest road from the residence of such child, as the byelaws may prescribe." It is enacted further, that "Any proceeding to enforce any byelaw may be taken, and any penalty for the breach of any byelaw may be recovered, in a summary manner; but no penalty imposed for the breach of any byelaw shall exceed such amount as with the costs will amount to five shillings for each offence."

In clauses 75 to 95, headed "Miscellaneous," further directions are given regarding the mode of supervision of schools by the district board and Education Department, and the next four clauses following, 96 to 99, treat of parliamentary grants. It is enacted by clause 96, that "After the 31st of March, 1871, no parliamentary grant shall be made to any elementary school which is not a public elementary school within the meaning of this Act. No parliamentary grant shall be made in aid of building, enlarging, improving, or fitting up any elementary school, except in pursuance of a memorial duly signed, and containing the information required by the Education Department for enabling them to decide on the application, and sent to the Education Department on or before the 31st of December, 1871." Clause 97 orders that "The conditions required to be fulfilled by an elementary school in order to obtain an annual parliamentary grant shall be those contained in the minutes of the Education Department in force for the time being, and shall amongst other matters provide that after the 31st of March, 1870, such grant shall not be made in respect of any instruction in religious subjects; and such grant shall not for any year exceed the income of the school for that year which was derived from voluntary contributions, and from school fees, and from any sources other than the parliamentary grant. But such conditions shall not require that the school shall be in connexion with a religious denomination, or that religious instruction shall be given in the school, and shall not give any preference or advantage to any school on the ground that it is or is not provided by a school board. Provided that where the school board satisfy the Education Department that in any year ending the 29th of September the sum required for the purpose of the annual expenses of the school board of any school district, and actually paid to the treasurer of such board by the rating authority, amounted to a sum which would have been raised by a rate of 3*d.* in

the pound on the rateable value of such district, and any such rate would have produced less than 20*l.*, or less than 7*s.* 6*d.* per child of the number of children in average attendance at the public elementary schools provided by such school board, such school board shall be entitled, in addition to the annual parliamentary grant in aid of the public elementary schools provided by them, to such further sum out of moneys provided by Parliament as, when added to the sum actually so paid by the rating authority, would, as the case may be, make up the sum of 20*l.*, or the sum of 7*s.* 6*d.* for each such child."

The 100th, and last, clause orders, "The Education Department shall in every year cause to be laid before both Houses of Parliament a report of their proceedings under this Act during the preceding year."

PUBLIC SCHOOLS.

[33 and 34 Victoriæ, cap. 84.—August 9, 1870.]

An Act to amend the Public Schools Act, 1868.

This Act amends 31 and 32 Victoriæ, cap. 118 (abstracted in 'Companion to the Almanac' for 1869, pp. 148-50) as regards the time of its operation. The Act has but three clauses, with a preamble reciting that by the Act of 1868 "certain powers of making statutes and regulations are vested in the new governing bodies of the several schools," and that these powers "have been continued by Her Majesty, but will, unless Parliament otherwise provides, on and after the 1st of January, 1871, pass to the said Special Commissioners;" and that "it is expedient to postpone for such further time as is hereinafter mentioned the transfer of such powers as aforesaid to the said Special Commissioners, and to continue for a further time the powers of the said Special Commissioners." In consequence, it is enacted that "All powers by the Public Schools Act, 1868, or any Act amending the same, vested in the new governing bodies of the several schools to which the said Public Schools Act applies, shall continue vested in such new governing bodies respectively until the 31st of July, 1871, and from and after the said 31st of July, 1871, and not before, shall pass to and vest in the said Special Commissioners, subject nevertheless as in the said Act mentioned. Subject to the provisions of this Act, all powers conferred on the Special Commissioners by the Public Schools Act, 1868, or any Act amending the same, shall be in force until the 31st of July, 1872, and it shall be lawful for Her Majesty, if she think fit, by and with the advice of her Privy Council, to continue the same until the 31st of December, 1872."

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3. CRIME AND PAUPERISM.

ABSCONDING DEBTORS.

[33 and 34 Victoriæ, cap. 76.—August 9, 1870.]

An Act to facilitate the Arrest of Absconding Debtors.

The Act has six clauses, with a preamble stating that "the laws now in force for the arrest of debtors absconding from England are insufficient for that purpose," and that "frauds may be perpetrated upon creditors by insolvent debtors departing for distant countries before the necessary proceedings can be taken to make them bankrupt." In consequence, clause 1 enacts that the Court of Bankruptcy "may by warrant

addressed to any constable or prescribed officer of the court, cause a debtor to be arrested and safely kept as prescribed until such time as the Court may order, if, after a debtor's summons has been granted in the manner prescribed by the said Act, and before a petition of bankruptcy can be presented against him, it appear to the Court that there is probable reason for believing that he is about to go abroad, with a view of avoiding payment of the debt for which the summons has been granted, or of avoiding service of a petition of bankruptcy, or of avoiding appearing to such petition, or of avoiding examination in respect of his affairs, or otherwise avoiding, delaying, or embarrassing proceedings in bankruptcy: Providing always, that nothing herein contained shall be construed to alter or qualify the right of the debtor to apply to the Court in the prescribed manner to dismiss the said summons as in the said Act is provided, or to pay, secure, or compound for the said debt within the time by the said Act provided, without being deemed to have committed an act of bankruptcy; and provided also, that upon any such payment or composition being made, or such security offered as the Court shall think reasonable, the said debtor shall be discharged out of custody, unless the Court shall otherwise order." Clause 2 enacts that "no arrest shall be valid or protected under this Act unless the debtor, before or at the time of his arrest, shall be served with the debtors' summons." The remaining four clauses contain details as to securities for debt, construction of terms, costs, and fees.

EXTRADITION OF CRIMINALS.

[33 and 34 Victoriæ, cap. 52.—August 1, 1870.]

An Act for amending the Law relating to the Extradition of Criminals.

The Act contains twenty-seven clauses, with three schedules, and refers to the extradition of criminals, in the surrender to foreign states, of persons accused or convicted of the commission of certain crimes within the jurisdiction of such states, and to the trial of criminals surrendered by foreign states to this country. Five statutes on the same subject are repealed. A list of the crimes to which the new law is applicable is given, of nearly every description, from murder to cases of fraud. Where an arrangement has been made with a foreign state with respect to the surrender of any fugitive criminal Her Majesty may, by Order in Council, direct the Act to apply in the case of such foreign state. The Secretary of State may, by order under his hand, require a police magistrate to issue a warrant; and it is further enacted that, "if the Secretary of State is of opinion that the offence is one of a political character he may, if he thinks fit, refuse to send any such order, and may also at any time order a fugitive criminal accused or convicted of such offence to be discharged from custody." A police magistrate is to hear the case in the same manner, and have the same jurisdiction and power, as in an indictable offence committed in England. The magistrate may take evidence to show that the crime is an offence of a political character, or is not an extradition crime. By this Act a warrant of a police magistrate may be executed in any part of the United Kingdom, as if the same had been issued or endorsed by a justice having jurisdiction where it was executed.

FORFEITURE FOR TREASON AND FELONY.

[33 and 34 Victoriæ, cap. 23.—July 4, 1870.]

An Act to abolish Forfeitures for Treason and Felony, and to otherwise amend the Law relating thereto.

The Act has thirty-three clauses, with a preamble reciting that "it is expedient to abolish the forfeiture of lands and goods for treason and felony," All the enactments concern, as here expressed, "lands and goods," with the exception of that of clause 31, repealing the obsolete statutes of 30 Geo. III. cap. 48, and 54 Geo. III. cap. 146, under which persons convicted of high treason were ordered to be "drawn on a hurdle to the place of execution," and which directed further after execution "the severing of the head from the body, and the dividing of the body into four quarters." The essence of the Act is contained in the first clause. It orders that "after the passing of this Act no confession, verdict, inquest, conviction, or judgment of or for any treason, or felony, or *felo de se*, shall cause any attainder, or corruption of blood, or any forfeiture or escheat, provided that nothing in this Act is to affect the law of forfeiture consequent upon outlawry." Conviction for treason or felony is to be a disqualification for holding offices. Persons condemned of treason or felony may be condemned in costs, and for loss of property a Court may award any sum of money not exceeding 100*l.* by way of satisfaction or compensation. When a convict has completed his term of imprisonment, or been made a bankrupt, &c., he is exempted from the operation of the Act. The Crown may appoint an administrator of a convict's property, who may pay debts or sums awarded by law or equity to persons defrauded by criminal acts of the convict, and allowances may be made for the support of the family of the convict. The property is to be preserved for the convict, and to revert to him on the completion of his sentence, death, &c. In default of an administrator being appointed by the Crown, an *interim curator* may be appointed by magistrates. Further execution on judgments may be issued against the property of convicts. There are other provisions amending the law as to the property of persons convicted of treason or felony. The Act does not extend to Scotland.

FORGERY.

[33 and 34 Victoriæ, cap. 58.—August 9, 1870.]

An Act to further amend the Law relating to Indictable Offences by Forgery.

The Act has eight clauses, with an annexed schedule, stating that it is to be construed as one statute with the 24 and 25 Vict., cap. 98, to consolidate and amend the statute law of England and Ireland on forgery, and to extend to the United Kingdom. It is enacted by clause 2 that "if any person forges or alters, or offers, utters, disposes of, or puts off, knowing the same to be forged or altered, any stock certificate or coupon issued in pursuance of part 5 of the National Debt Act, 1870, or of any former Act, or demands or endeavours to obtain or receive any share or interest of or in any stock as defined in the National Debt Act, 1870, or to receive any dividend or money payable in respect thereof, by virtue of any such forged or altered certificate, or coupon, or document, purporting as aforesaid, knowing the same to be forged or altered, with intent in any of the cases aforesaid to defraud, he shall be guilty of felony, and, being convicted thereof, shall be liable at the discretion

of the Court to be kept in penal servitude for life, or for any term not less than five years, or to be imprisoned for any term not exceeding two years, with or without hard labour, and with or without solitary confinement." For falsely personating an owner of stock the like sentence is to be inflicted. For engraving plates, &c., for stock certificates fourteen years' penal servitude can be awarded, and for forgery of transfer of stocks from England to Ireland, &c., the punishment is to be from two years' imprisonment to penal servitude for life.

METROPOLITAN PAUPERS.

[33 and 34 Victoriæ, cap. 18.—July 4, 1870.]

An Act to provide for the Equal Distribution over the Metropolis of a Further Portion of the Charge for the Relief of the Poor.

The Act amends 30 and 31 Vict. cap. 6 (abstracted in 'Companion to the Almanac' for 1868, pp. 184-86) as far as concerns the 69th section, under which, after each half-yearly audit, the auditors must certify to the Poor Law Board the amount actually disbursed by each union or parish in respect of expenses that are to be repaid out of the Common Poor Fund. This provision is now to extend to the expenses incurred for the maintenance of paupers in any other asylum, as well as to the maintenance of paupers above the age of 16 in any workhouse of the metropolis. The Poor Law Board is empowered to certify the maximum number of paupers to be maintained in any metropolitan workhouse or asylum. It is further enacted that the amount to be repaid to unions or parishes out of the Common Poor Fund is to be at the rate of 5*d.* per day for each pauper in a workhouse or asylum. By another provision the term "salaries of officers" is to include the cost of the rations of the officers according to a scale to be settled by the Poor Law Board. The Act came into operation on the 29th of September, 1870.

REMOVAL OF PAUPERS.

[33 and 34 Victoriæ, cap. 48.—August 1, 1870.]

An Act for removing Doubts respecting the Payment of Expenses incurred in the Conveyance of Paupers in certain Cases not expressly provided for by the Law.

The Act amends and applies 4 and 5 Wm. IV. cap. 76, as to poor relief. It is enacted that the Poor Law Board may, by order, define and direct in what cases other than those expressly provided for by law, and under what regulations, the Guardians of any union or parish may pay the reasonable expenses incurred by them in conveying any person chargeable to such union or parish from one place to another in England, and may charge such expenses upon the common fund of the union, or other like fund under their control.

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4. FINANCE AND TAXATION.

CUSTOMS AND INLAND REVENUE.

[33 and 34 Victoriæ, cap. 32.—August 1, 1870.]

An Act to grant certain Duties of Customs and Inland Revenue, and to repeal and alter other Duties of Customs and Inland Revenue.

The Act, which has sixteen clauses, with three schedules annexed, repeals and modifies a number of customs, excise, and stamp duties, and makes provision for the levying of others. It is also enacted, under

Clause 16, that "the poundage now payable to collectors in respect of the amount of the duties on inhabited houses collected and paid to the proper officer for receipt shall be divided in each separate collection between the assessors and collectors in equal proportions." Among the most important charges in the Act is that of customs duties on sugar, the new tariff of which is fixed as follows:—

		£	*s.*	*d.*
Sugar, viz.:—				
Candy, brown or white, refined sugar, or sugar rendered by any process equal in quality thereto, and manufactures of refined sugar	the cwt.	0	6	0
Sugar not equal to refined:—				
First class	the cwt.	0	5	8
Second class	„	0	5	3
Third class	„	0	4	9
Fourth class, including cane juice	„	0	4	0
Molasses	„	0	1	9
Almonds, paste of	„	0	4	8
Cherries, dried	„	0	4	8
Comfits, dry	„	0	4	8
Confectionery, not otherwise enumerated	„	0	4	8
Ginger, preserved	„	0	4	8
Marmalade	„	0	4	8
Succades, including all fruits and vegetables preserved in sugar, not otherwise enumerated	„	0	4	8

The Act orders that these duties shall be "paid on the weights ascertained at landing."

As regards stamp duties, it is provided, under clause 12, that from the 1st of October, 1870, the stamp duties on newspapers shall cease and determine. The next clause, number 13, greatly reduces the duty on certain policies of insurance. It runs: "On and after the 1st of July, 1870, there shall be charged and paid upon every policy of insurance for any payment agreed to be made upon the death of any person, only from accident or violence, or otherwise than from a natural cause, or as compensation for personal injury, or by way of indemnity against loss or damage of or to any property, a stamp duty of one penny."

GUN LICENSES.

[33 and 34 Victoriæ, cap. 57.—August 9, 1870.]

An Act to grant a Duty of Excise on Licenses to use Guns.

The Act, which has twelve clauses, imposes a new duty on every person who shall use or carry a gun in the United Kingdom of 10*s.* from the 1st of April last. The licences are granted by the Inland Revenue Commissioners. Any person who shall use or carry a gun, elsewhere than in a dwelling house or the curtilage thereof, without a license, is to forfeit 10*l.* The persons exempt are those in the military or naval service. Volunteers, or police, or any person carrying a gun belonging to a person licensed to kill game, or a gunsmith. Clause 8 enacts: "Where a gun is carried in parts by two or more persons in company, each and every one shall be deemed to carry the gun." A licence is to be produced on demand by an excise officer or constable under clause 9; and, "If the person upon whom the demand is made shall not produce a licence duly granted to him under this Act, or a

licence or certificate to kill game granted to him under the laws of excise, and permit the officer or constable demanding the production thereof to read such licence or certificate, it shall be lawful for such officer or constable to require such person to declare to him immediately his christian and surname and place of residence, and if such person shall refuse to declare his christian and surname and place of residence as aforesaid, he shall for such refusal forfeit the penalty of 10*l.* over and above any other penalty to which he may be liable under this or any other Act of Parliament; and it shall be lawful for such officer or constable to arrest such person so refusing." The term "gun" is defined in the Act as "a firearm of any description, and an air-gun or any other kind of gun from which any shot, bullet, or other missile can be discharged."

STAMP DUTIES MANAGEMENT.

[33 and 34 Victoriæ, cap. 98.—August 10, 1870.]

An Act for consolidating and amending the Law relating to the Management of Stamp Duties.

The Act, containing twenty-seven clauses, relates mainly to licences to deal in stamps, and to the penalties to be inflicted for forging stamps or dies. Clause 5 enacts that the Commissioners of Inland Revenue "may, at their discretion, grant a licence to any person to deal in stamps at any place or places in the United Kingdom to be named in such license, and every person to whom any such license is granted shall enter a bond (which shall be exempt from stamp duty) to Her Majesty, her heirs, or successors, in a penal sum of 100*l.*, with a condition that such licensed person does not sell or offer for sale or exchange, or keep or have in his possession for the purpose of sale or exchange, any stamps other than such as he has purchased or procured at the chief office, or at one of the head offices, or from some person duly appointed to sell and distribute stamps, or duly licensed to deal in stamps." It is further ordered, in clause 7, that "every person who, not being duly appointed to sell and distribute stamps, or duly licensed to deal in stamps, deals in any manner in stamps in any part of the United Kingdom; or who, being duly licensed to deal in stamps, deals in any manner in stamps at any house, shop, or place not specified and described in his licence, shall for every such offence forfeit the sum of 20*l.*" Clause 8 enacts that, "every person who is licensed to deal in stamps shall cause to be painted at full length, in Roman capital letters, one inch at least in height, and of a proper and proportionate breadth, on some conspicuous place on the outside of the front of every house or shop in or at which he is licensed to deal in stamps, and so that the same may be at all times plainly and distinctly visible, and legible, his christian name and surname, together with the words 'Licensed to sell stamps,' and shall continue such names and words, so painted as aforesaid during all the time that he continues licensed as aforesaid, and for every neglect or omission in any of such matters shall forfeit the sum of 10*l.*" There are further provisions concerning the allowance for spoiled stamps, as well as for stamps not wanted, which may be repurchased by the Commissioners of Inland Revenue.

5. LAW AND JUSTICE.

CHARITABLE FUNDS INVESTMENT.

[33 and 34 Victoriæ, cap. 34.—August 1, 1870.]

An Act to amend the Law as to the Investment on Real Securities of Trust Funds held for Public and Charitable Purposes.

The Act is short, having but three clauses, the first two embodying the whole of the new law. It is enacted by clause 1 that, "it shall be lawful for all corporations and trustees in the United Kingdom holding moneys in trust for any public or charitable purpose to invest such moneys on any real security authorized by or consistent with the trusts on which such moneys are held, without being deemed thereby to have acquired or become possessed of any land within the meaning of the laws relating to mortmain, or of any prohibition or restraint against the holding of land by such corporations or trustees contained in any charter or Act of Parliament; and no contract for or conveyance of any interest in land made *bonâ fide* for the purpose only of such security shall be deemed void by reason of any non-compliance with the conditions and solemnities required by an Act passed in the ninth year of King George II., intituled "An Act to restrain the disposition of lands whereby the same become unalienable." It is provided by clause 2, that "in every case in which the equity of redemption of the premises comprised in any such security shall become liable to foreclosure, or otherwise barred or released, the same shall be thenceforth held in trust, to be sold and converted into money, and shall be sold accordingly; and if any decree shall be made in any suit for the purpose of redeeming or enforcing such security, such decree shall direct a sale, in default of redemption, and not a foreclosure of such premises." The third and last clause of the Act gives the interpretation of terms.

EVIDENCE AMENDMENT.

[33 and 34 Victoriæ, cap. 49.—August 9, 1870.]

An Act to explain and amend the Evidence Further Amendment Act, 1869.

The Act supplements 32 and 33 Vict., cap. 68 (abstracted in 'Companion to the Almanac for 1870,' p. 238) as regards the meaning of the expressions "courts of justice," and "presiding judge." It was enacted by 32 and 33 Vict., cap. 68, that, "If any person called to give evidence in any court of justice, whether in a civil or criminal proceeding, shall object to take an oath, or shall be objected to as incompetent to take an oath, such person shall, if the presiding judge is satisfied that the taking of an oath would have no binding effect on his conscience, make the following promise and declaration:

"I solemnly promise and declare, that the evidence given by me to the Court shall be the truth, the whole truth, and nothing but the truth."

The present Act says, that "doubts have arisen as to the extent and meaning of the words "court of justice" and "presiding judge," and in consequence, proceeds to enact that the words "court of justice," and the words "presiding judge," in the said Evidence Further Amendment Act, 1869, shall be deemed to include any person or persons having by law authority to administer an oath for the taking of evidence. The Act does not extend to Scotland.

JOINT STOCK COMPANIES ARRANGEMENT.

[33 and 34 Victoriæ, cap. 104.—August 10, 1870.]

An Act to facilitate Compromises and Arrangements between Creditor and Shareholder of Joint-Stock, and other Companies in liquidation.

The Act contains four clauses, summed up in the second, which runs as follows:—"Where any compromise or arrangement shall be proposed between a company which is, at the time of the passing of this Act or afterwards, in the course of being wound up, either voluntarily or by or under the supervision of the Court, under the Companies Acts 1862 and 1867, or either of them, and the creditors of such company, or any class of such creditors, it shall be lawful for the Court, in addition to any other of its powers, on the application in a summary way of any creditor or the liquidator, to order that a meeting of such creditors or class of creditors shall be summoned in such manner as the Court shall direct, and if a majority in number representing three-fourths in value of such creditors or class of creditors present either in person or by proxy at such meeting shall agree to any arrangement or compromise, such arrangement or compromise shall, if sanctioned by an order of the Court, be binding on all such creditors or class of creditors, as the case may be, and also on the liquidator and contributories of the said company."

JURIES.

[33 and 34 Victoriæ, cap. 77.—August 9, 1870.]

An Act to amend the Laws relating to the qualifications, summoning attendance, and remuneration of Special and Common Juries.

There are twenty-five clauses in the Act, with a schedule containing the descriptions of persons exempt from serving on juries. The Act took effect on the first day of Michaelmas Term, the 2nd of November, 1870. It is not to apply to Scotland or Ireland. The status required for a special juror is defined, as also of juries in Wales. Aliens are to be qualified after ten years' domicile. Convicts, except outlaws, are disqualified. The overseers are to specify special jurors, and disqualification or exemption to be pleaded before the revision of the list. Justices are to certify the jury lists after revision. Special jurors' names are to be retained in jurors' book. Special jurors for London and Middlesex are to be provided in the same manner as in other counties. The present practice of nominating special jurors in London and Middlesex is abolished. In London and Middlesex, subject to any rules which may be made by any of the superior Courts in that behalf, any party to any action triable at any of the sittings of the superior Courts, shall be entitled to have the cause tried by a special jury, upon the same conditions as would entitle him to have it so tried in any county other than London and Middlesex. In London and Middlesex every Court or judge shall have the same power of ordering that a cause be tried by a special jury as the like Court or judge would have if the cause were tried in any other county than London and Middlesex. With respect to the summoning of jurors it is enacted that no person shall be summoned to serve on any jury or inquest (except a grand jury) more than once in any one year, unless all the jurors upon the list shall have been already summoned to serve during such year. No person to be exempted from serving as a common juror by being on the list as a special juror, and "no person shall be summoned or liable to serve as a juror in more than one court on the same day." Jurors are to be entitled to six days'

notice, and regulations are to be made by sheriffs as to the attendance. On the subject of remuneration it is provided, "Every special juror when summoned for the purpose of trying special jury cases, at the rate of 1*l.* 1*s.* for every day of his attendance. The remuneration of a juror when trying common jury cases shall be at the rate of 10*s.* for every day of his attendance. The above-mentioned remuneration shall be paid by the parties to the causes to be tried, and for that purpose each of the said parties shall deposit such sum of money as may be determined by any rule of the Court in which the cause is depending, and such deposit shall be made at such time and with such officer as the said Court may prescribe." Jurors may be allowed a fire when out of court, "and be allowed reasonable refreshment, such refreshment to be procured at their own expense." The judges of the superior Courts are empowered to make rules to carry out the several provisions of the Act. The jury lists in the City of London are to be made out as before the passing of the Act. The new statute does not provide for the payment of jurors in criminal cases, and there is some ambiguity as to payment of jurors in civil cases. A special juror "when summoned for the purpose of trying special jury cases" is to be paid for every day of his attendance, and a common juror "when trying common jury cases at the rate of 10*s.* for every day of his attendance."

LAND LAWS OF IRELAND.

[33 and 34 Victoriæ, cap. 46.—August 1, 1870.]

An Act to amend the Law relating to the Occupation and Ownership of Land in Ireland.

There are in this important Act seventy-three clauses, arranged under five divisional parts. Part I., containing thirty-one clauses, is headed "Law of Compensation to Tenants;" part II., with ten clauses, "Sale of Land to Tenants;" part III., with fifteen clauses, "Advances by, and Powers of Board of Public Works;" part IV., with eight clauses, "Supplemental Provisions"; and, lastly, part V., containing nine clauses, is entitled, "Miscellaneous."

The first clause of the Act establishes the legality of the Ulster tenant-right custom, or "the usages prevalent in the province of Ulster," with this qualification that "where the landlord has purchased or acquired, or shall hereafter purchase or acquire, from the tenant the Ulster tenant-right custom to which his holding is subject, such holding shall thenceforth cease to be subject to the Ulster tenant-right custom." Clause 2 enacts that "if in the case of any holding not situate within the province of Ulster it shall appear that an usage prevails which in all essential particulars corresponds with the Ulster tenant-right custom, it shall in like manner be deemed legal. Next, in clause 3, the Act decrees the amount of compensation to be awarded in absence of custom. It is enacted that where the tenant "is disturbed in his holding by the act of the landlord, he shall be entitled to such compensation for the loss which the Court shall find to be sustained by him by reason of quitting his holding, to be paid by the landlord, as the Court may think just, so that the sum awarded does not exceed the scale following; that is to say,—In the case of holdings valued under the Acts relating to the valuation of rateable property in Ireland at an annual value of—

(1.) 10*l.* and under, a sum which shall in no case exceed seven years' rent;

(2.) Above 10*l.* and not exceeding 30*l.*, a sum which shall in no case exceed five years' rent;

(3.) Above 30*l.* and not exceeding 40*l.*, a sum which shall in no case exceed four years' rent;

(4.) Above 40*l.* and not exceeding 50*l.*, a sum which shall in no case exceed three years' rent;

(5.) Above 50*l.* and not exceeding 100*l.*, a sum which shall in no case exceed two years' rent;

(6.) Above 100*l.* a sum which shall in no case exceed one year's rent;

but in no case shall the compensation exceed the sum of 250*l.*"

It is provided by clause 3 that "a tenant shall not be entitled to any compensation in respect of any of the improvements following; that is to say,—

(*a.*) In respect of any improvement made before the passing of this Act, and twenty years before the claim of such compensation shall have been made, except permanent buildings and reclamation of waste land; or,

(*b.*) In respect of any improvement prohibited in writing by the landlord as being and appearing to the Court to be calculated to diminish the general value of the landlord's estate, and made within two years after the passing of this Act, or made during the unexpired residue of a lease granted before the passing of this Act; or,

(*c.*) In respect of any improvement made either before or after the passing of this Act in pursuance of a contract entered into for valuable consideration therefor; or,

(*d.*) (Subject to the rule in this section mentioned as to contracts) in respect of any improvement made, either before or after the passing of this Act, in contravention of a contract in writing not to make such improvement; or,

(*e.*) In respect of any improvement made, either before or after the passing of this Act, which the landlord has undertaken to make, except in cases where the landlord has failed to perform his undertaking within a reasonable time."

The sixthe lause of the Act gives permission to tenants to register any improvements they may make in the Landed Estates Court; the seventh clause refers to compensation in respect of payment to incoming tenant, and the eighth to compensation in respect of crops. There is a limitation as to disturbance in holdings provided for by the ninth clause, while the tenth enacts that it "shall not be deemed a disturbance within the meaning of this Act," if a landlord "after six months' notice in writing to be served upon the tenant or left at his house, resume possession from a yearly tenant of so much land, not to exceed in the whole one twenty-fifth part of any individual holding, as he may require for the bonâ fide purpose of erecting thereon one or more labourers' cottages, with or without gardens attached." The next clause, number 11, treats of the derivative title of tenant; the 12th of the partial exemption of certain tenancies, and the 13th of restrictions as to compensation in certain cases of assignment. It is further directed, by clause 14, that eviction in certain cases, such as "persistent exercise of any right not necessary to the due cultivation of his holding by the tenant," shall not be deemed a disturbance, and further exemption is made, by clause 15, in regard to public lands, "demesne land, or any holding ordinarily termed town-park," as well as lettings in conacre and cottage allotments not exceeding a quarter of an acre.

The proceedings to be taken under the Act in respect of claims are

directed in the next two clauses, as follows:—"Every tenant entitled under this Act to make any claim in respect of any right or for payment of any sums due to him by way of compensation, and about to quit his holding, may within the prescribed time serve a notice of such claim on his landlord, or in his absence his known agent; the notice shall be in writing in the prescribed form, and shall state the particulars of such claim, subject to such amendment as the Court may allow, together with the dates at which and the periods within which such particulars are severally alleged to have accrued, and, where such claim or any part of the same is in respect of compensation under the provisions of section three of this Act, the number of years' rent claimed shall be specified. On the receipt of the notice the landlord shall be deemed to have admitted the claim made by the tenant, unless within the prescribed time and in the prescribed manner he serves a notice on the tenant stating that he disputes the whole or some portion of the claim made by the latter, and upon service of such notice by a landlord on the tenant a dispute shall be deemed to have arisen between the landlord and the tenant as to the whole or a portion of such claim, and such dispute shall be decided by the Court, unless within the time and in the manner prescribed in that behalf such dispute shall have been settled by agreement between the landlord and tenant." The next three clauses refer to equities between landlord and tenant, and rules of eviction, and the following two enact the composition of "the Court," cited as such in preceding sections. It is enacted by clause 22 that "the Court shall mean one or other of the tribunals following, that is to say, the Civil Bill Court of the county where the matter requiring the cognisance of the Court arises; or, the Court of Arbitration constituted as in this Act mentioned. Where a matter requiring the cognisance of the Court arises in respect of a holding situate within the jurisdiction of more than one Civil Bill Court, any Civil Bill Court within the jurisdiction of which any part of the holding is situate may take cognisance of the matter." Clause 23 orders, "the judge of the Civil Bill Court (hereinafter called the chairman), shall, in all cases brought before him under the provisions of this Act, have power to take evidence upon oath, and to compel the attendance of witnesses, and shall have all and the same powers, jurisdiction, and authority as in cases of civil bill ejectment coming within his jurisdiction as such judge: provided always, that the judge shall himself without a jury decide any question of fact arising in any case brought before him under this Act. The chairman may, with the consent of both parties, hear and determine any case brought before him under this Act in chamber, if he so thinks fit, and when so sitting in chamber he shall have all and the same powers, jurisdiction, and authority in respect to cases so heard as if sitting in open court." The next eleven clauses, 21 to 31, which conclude the first part of the Act, give direction as to modes of appeal, powers of "limited owners," and general rules for carrying the statute into effect.

The next great division of the Act, marked as part II., is entirely filled with directions as to the sale of land by proprietors to tenants. In the first place it is provided what landlords may sell,—that is, not only absolute owners in fee simple, but even tenants for life under settlements, or lessees for lives or years, renewable for ever, or even for years, if sixty years remain unexpired. The parties have to agree between themselves as to the price or purchase-money; but when they have agreed, the Commissioners of Public Works may, upon their application, make proper inquiries as to encumbrancers or owners, &c., and if they think

right, under all the circumstances, they may allow and carry out a sale, the purchase-money to be paid as they think best, and the land to be conveyed to the tenants by them; such conveyance to constitute a good title, free from all encumbrances, except certain specified charges, such as tithe-rent charges, charges for draining, and so forth. The Board have full power to determine all necessary questions, and to determine finally, though with the power, if they think proper, to submit questions to the Court, that is, the Court for Lands Cases Reserved, or the Civil Bill Court, according as the former Court may think proper. And the Privy Council in Ireland may make such rules as may appear to be required for carrying out this portion of the Act. It is finally enacted under clause 41, last of part II., that "any rules made in pursuance of this section shall be laid before Parliament within three weeks after they are made, if Parliament be then sitting, and if Parliament be not then sitting, within three weeks after the beginning of the then next session of Parliament."

Part III. contains some important provisions in respect of advances which the Board of Public Works may make to landlords as compensation for improvements, and also of advances to tenants for purchase of holdings. As regards the latter, clause 44 enacts that "the Board, if they are satisfied with the security, may advance to any tenant for the purpose of purchasing his holding in pursuance of this Act any sum not exceeding two-thirds of the price of such holding, and upon an order being made by the Civil Bill Court to that effect, and upon such advance being made by the Board, such holding shall be deemed to be charged with an annuity of 5*l.* for every 100*l.* of such advance, and so in proportion for any less sum." By clauses 45 and 46, the Landed Estates Court is made instrumental for facilitating purchases of land by tenants "so far as is consistent with the interests of the persons interested in the estates." A still more important provision, that to make advances to facilitate purchases of entire estates by their tenants, is enacted under clause 47. The clause runs:—"Where the landlord of an estate is willing to contract for the sale under the second part of this Act of his estate in its entirety but not in part, and the tenants of the holdings comprising four-fifths in value of such estate are willing to purchase their holdings, and other purchasers can be found to buy the residue of such estate, and to pay one half of the purchase-money payable in respect of such residue, such sale may be made accordingly under the second part of this Act in the same manner as if the whole of the purchasers of the estate were tenants of the landlord, and the Board may advance to such other purchasers one half of their purchase-money upon the security of the residue of the estate, and such advance may, at the discretion of the Board, be made to such purchasers collectively on the security of the whole of the residue of such estate, or to such purchasers severally on the security of the portions bought by them respectively, or partly in one way and partly in the other. Where any advance is made to purchasers or a purchaser under this section, the land bought by such purchaser or purchasers shall, on an order made to that effect by the Civil Bill Court, be charged with an annuity of 5*l.* for every 100*l.* of such advance, and so in proportion for any less sum, such annuity to be limited in favour of the Board, and to be declared to be repayable within the term of thirty-five years." It is directed further that the Board of Public Works, in making advances, shall be under the control of the Treasury, and clause 54 enacts "there shall be issued to the Board for the purposes of this Act, at such times and in such sums and

in such manner as the Treasury may determine, any sums of money not exceeding in the whole 1,000,000*l.*, and the Treasury may from time to time issue to the said Board the said sum of 1,000,000*l.* out of the Consolidated Fund."

The last two divisions of the Act, headed "Supplemental Provisions" and "Miscellaneous," refer chiefly to legal proceedings in the Civil Bill Court, grand jury cess, and tenancies at will, the last of which are declared to be equal to tenancies from year to year. Clause 70 gives the definition in the construction of the Act, the most important of them being that "the term 'tenant' in relation to a holding shall mean any tenant from year to year and any tenant for a life or lives or for a term of years under a lease or contract for a lease, whether the interest of such tenant has been acquired by original contract, lawful assignment, devise, bequest, or act and operation of law." Clause 71 enacts that "this Act shall not apply to any holding which is not agricultural or pastoral in its character, or partly agricultural and partly pastoral; and the term 'holding' shall include all land of the above character held by the same tenant of the same landlord for the same term and under the same contract of tenancy." Finally, clause 73 and last clause, orders "this Act shall apply to Ireland only."

LIFE ASSURANCE COMPANIES.

[33 and 34 Victoriæ, cap. 61.—August 9, 1870.]

An Act to amend the Law relating to Life Assurance Companies.

The Act has twenty-five clauses, with six schedules annexed. The first two clauses contain titles and interpretation of terms, the word "Court" being explained as meaning "the High Court of Chancery," and "registrar" meaning "the registrar of joint stock companies." Clause 3 enacts the conditions for the establishment of new life assurance companies. "Every company established after the passing of this Act within the United Kingdom, and every company established or to be established out of the United Kingdom, which shall, after the passing of this Act, commence to carry on the business of life assurance within the United Kingdom, shall be required to deposit the sum of 20,000*l.* with the Accountant General of the Court of Chancery, to be invested by him in one of the securities usually accepted by the Court for the investment of funds placed from time to time under its administration, the company electing the particular security and receiving the income therefrom, and the registrar shall not issue a certificate of incorporation unless such deposit shall have been made, and the Accountant General shall return such deposit to the company so soon as its life assurance fund accumulated out of the premiums shall have amounted to 40,000*l.*" The next clause, number four, deals with companies transacting fire, or other insurance, besides life, ordering as follows:—"In the case of a company established after the passing of this Act, transacting other business besides that of life assurance, a separate account shall be kept of all receipts in respect of the life assurance and annuity contracts of the company, and the said receipts shall be carried to and form a separate fund, to be called the life assurance fund of the company, and such fund shall be as absolutely the security of the life policy and annuity holders as though it belonged to a company carrying on no other business than that of life assurance, and shall not be liable for any contracts of the company for which it would not have been liable had the business of the company been only that of life assurance; and

in respect to all existing companies, the exemption of the life assurance fund from liability for other obligations than to its life-policy holders shall have reference only to the contracts entered into after the passing of this Act, unless by the constitution of the company such exemption already exists: Provided always, that this section shall not apply to any contracts made by any existing company by the terms of whose deed of settlement the whole of the profits of all the business are paid exclusively to the life-policy holders, and on the face of which contracts the liability of the assured distinctly appears."

It is enacted by clauses 5 to 11 that every life insurance company shall make annual reports, after form specified in schedules, of its financial position, and an actuarial report and abstract either every five or ten years, also after specified forms, which documents are to be printed and deposited with the Board of Trade, and copies of it given to all shareholders and policyholders. Companies are moreover bound, under clauses 12 and 13, to print lists of shareholders, and deeds of settlement, to be issued on application to all interested at a specified price. The next two clauses, 14 and 15, refer to amalgamation. It is enacted by clause 14 that "Where it is intended to amalgamate two or more companies, or to transfer the life assurance business of one company to another, the directors of any one or more of such companies may apply to the Court, by petition, to sanction the proposed arrangement, notice of such application being published in the *Gazette*, and the Court, after hearing the directors and other persons whom it considers entitled to be heard upon the petition, may confirm the same if it is satisfied that no sufficient objection to the arrangement has been established. Before any such application is made to the Court a statement of the nature of the amalgamation or transfer, as the case may be, together with an abstract containing the material facts embodied in the agreement or deed under which such amalgamation or transfer is proposed to be effected, and copies of the actuarial or other reports upon which such agreement or deed is founded, shall be forwarded to each policyholder of both companies in case of amalgamation, or to each policyholder of the transferred company in case of transfer, by the same being transmitted in manner provided by section 136 of the Companies Clauses Consolidation Act, 1845, for the transmission to shareholders of notices not requiring to be served personally; and the agreement or deed under which such amalgamation or transfer is effected shall be open for the inspection of the policyholders and shareholders at the office or offices of the company or companies for a period of fifteen days after the issuing of the abstract herein provided. The Court shall not sanction any amalgamation or transfer in any case in which it appears to the Court that policyholders representing one-tenth or more of the total amount assured in any company which it is proposed to amalgamate, or in any company the business of which it is proposed to transfer, dissent from such amalgamation or transfer." Clause 15 orders that "When an amalgamation takes place between any companies, or when the business of one company is transferred to another company, the combined company or the purchasing company, as the case may be, shall, within ten days from the date of the completion of the amalgamation or transfer, deposit with the Board of Trade certified copies of statements of the assets and liabilities of the companies concerned in such amalgamation or transfer, together with a statement of the nature and terms of the amalgamation or transfer, and a certified copy of the agreement or deed under which such amalgamation or transfer is

effected, and certified copies of the actuarial or other reports upon which such agreement or deed is founded; and the statement and agreement or deed of amalgamation or transfer shall be accompanied by a declaration under the hand of the chairman of each company and the principal managing officer of each company, that to the best of their belief every payment made or to be made to any person whatsoever on account of the said amalgamation or transfer is therein fully set forth."

The remaining portions of the Act are mainly regarding penalties for non-performance. It is enacted by clause 18 that "Every company which makes default in complying with the requirements of this Act shall be liable to a penalty not exceeding 50*l.* for every day during which the default continues; and if default continue for a period of three months after notice of default by the Board of Trade, which notice shall be published in one or more newspapers as the Board of Trade may direct, and after such publication, the Court may order the winding up of the company, in accordance with the Companies Act, 1862, upon the application of one or more policyholders or shareholders." Clause 19 directs that "if any statement, abstract, or other document required by this Act is false in any particular to the knowledge of any person who signs the same, such person shall be liable on conviction thereof on indictment to fine and imprisonment, or on summary conviction thereof to a penalty not exceeding 50*l.*" It is finally enacted by clause 24, that "the Board of Trade shall lay annually before Parliament the statements and abstracts of reports deposited with them under this Act during the preceding year."

MARRIED WOMEN'S PROPERTY.

[33 and 34 Victoriæ, cap. 93.—August 9, 1870.]

An Act to amend the Law relating to the Property of Married Women.

The Act has seventeen clauses, with a preamble stating that "it is desirable to amend the law of property and contract with respect to married women." The law has not a retrospective effect, but only affects property "after the passing of the Act." The wages and earnings of any married woman, acquired or gained by her after the passing of the Act, in any employment, occupation, or trade in which she is engaged, or which she carries on separately from her husband, and also any money or property so acquired by her through the exercise of any literary, artistic, or scientific skill, and all investments of such wages, earnings, money, or property, shall be deemed and taken to be property held and settled to her separate use, independent of any husband to whom she may be married, and her receipts alone shall be a good discharge for such wages, earnings, and property. Deposits in savings-banks by a married woman are to be deemed her separate property. There are provisions as to property in the funds or in a joint stock company or society. All deposits of money in favour of creditors are to be invalid. Personal property coming to a married woman to be her own, as also freehold. In any question between husband and wife as to property declared by this Act to be the separate property of the wife, either party may apply by summons or motion in a summary way either in the Court of Chancery or, in England, to the judge of a county court, and there may be an appeal, and the judge may, if either party so require, hear the application in his private room. A married woman may effect a policy of insurance upon her own life or the life of her husband for her separate use. A policy of insurance effected by any married man on his own life and expressed upon the face of it to be for

the benefit of his wife or of his wife and children, or any of them, shall be deemed a trust for the benefit of his wife for her separate use. A married woman may maintain an action. A husband shall not, by reason of any marriage after this Act has come into operation, be liable for the debts of his wife contracted before marriage, but the wife shall be liable to be sued, and any property belonging to her for her separate use shall be liable to satisfy such debts as if she had continued unmarried. A married woman having separate property is to be liable to a parish on her husband becoming chargeable, and there is a similar provision as to the children of a married woman, as a widow is now by law subject to for the maintenance of her children, but the Act is not to relieve the husband of a married woman from any liability at present imposed on the husband by law to maintain her children. The Act is not to extend to Scotland.

RENTS AND PERIODICAL PAYMENTS.

[33 and 34 Victoriæ, cap. 35.—August 1, 1870.]

An Act for the better Apportionment of Rents and other Periodical Payments.

The Act has eleven clauses, with a preamble reciting that rents and some other periodical payments are not at common law apportionable like interest on money lent in respect of time, and that it is expedient to make provision for the remedy "of all such mischiefs and inconveniences." From and after the passing of the Act all rents, annuities, dividends, and other periodical payment in the nature of income, whether reserved or made payable under an instrument in writing or otherwise, shall, like interest on money lent, be considered as accruing from day to day, and shall be apportionable in respect of time accordingly. The apportioned part is to be payable when the next entire portion becomes due. The statute is not to apply to policies of insurance, nor, by clause 7, are its provisions "to extend to any case in which it is or shall be expressly stipulated that an apportionment shall take place."

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6. TRADE AND SHIPPING.

BROKERS.

[33 and 34 Victoriæ, cap. 60.—August 9, 1870.]

An Act to relieve the Brokers of the City of London from the Supervision of the Court of Mayor and Aldermen of the said City.

The preamble of the Act recites that "by an Act of Parliament made in the sixth year of the reign of Queen Anne, intituled 'An Act for repealing the Act of the first year of King James the First, intituled "An Act for the well garbling of spices and for granting an equivalent to the city of London by admitting brokers,"' it was amongst other things enacted that from and after the determination of the then session of Parliament all persons that should act as brokers within the city of London and liberties thereof, should from time to time be admitted so to do by the Court of Mayor and Aldermen of the said city for the time being under such restrictions and limitations for their honest and good behaviour as the said court should think fit and reasonable, and should upon such their admission pay to the chamberlain of the said city for the time being, for the uses thereinafter mentioned, the sum of 40*s.*, and should

also yearly pay to the said uses the sum of 40*s*," and that by other public and local Acts further restrictions were imposed upon brokers, and that "it is expedient to relieve the said brokers from the necessity of providing such sureties." In consequence it is enacted that "after the passing of this Act the Court shall not require a broker, by himself or sureties, to give any bond on his admission as a broker, and the jurisdiction, supervision, and control of the said court over brokers in the said city of London and the liberties thereof shall cease, and the said court shall not have power to make or enforce any rules, orders, regulations, restrictions, limitations, or penalties affecting, except as hereinafter mentioned, the admission of such brokers, or the manner in which the business of such brokers shall be carried on." By the sixth and last clause of the Act brokers committing fraud shall be disqualified, and their names be struck from the list of admitted brokers, which is to be kept "in the Mayor's Court of the city of London."

FACTORIES AND WORKSHOPS.

[33 and 34 Victoriæ, cap. 62.—August 9, 1870.]

An Act to amend and extend the Acts relating to Factories and Workshops.

The Act, which has six clauses, with three schedules annexed, is divided into two parts. The first part relates to print works and bleaching and dyeing works, fixing the hours of labour; it is to be construed as one with the "Factory Act Extension Act, 1867." After the 1st of January, 1872, the principal Act is to apply to print works and bleaching and dyeing works. Certain regulations are to be enforced on the 1st of January, 1871, in Turkey-red dyeing works, in respect to the labour of children and women. The second part of the statute relates to fruit and fish preserves. The schedule to the "Factory Acts Extension Act, 1867," and the schedule in the "Workshop Regulation Act, 1867," are to be construed as if they were contained in each of those schedules. In the schedules the permanent modifications are set forth. In the manufacture of preserves from fruit, and in the processes of preserving or curing fish, women may be employed between the 1st of June and the 14th of December, for a period not exceeding fourteen hours on any one day.

PASSENGERS' ACT AMENDMENT.

[33 and 34 Victoriæ, cap. 95.—August 9, 1870.]

An Act to authorize the Carriage of Naval and Military Stores in Passenger Ships.

The Act, which is short, having only three clauses, amends 18 & 19 Vict. cap. 119, by which it was ordered that "no passenger ship shall clear out or proceed to sea if there shall be on board as cargo, horses, cattle, gunpowder, vitriol, lucifer matches, guano, or green hides, nor if there shall be on board any other article or number of articles, whether as cargo or ballast, which, by reason of the nature or quantity or mode of stowage thereof, shall, either singly or collectively, be deemed by the emigration officer at the port of clearance likely to endanger the health or lives of the passengers, or the safety of the ship." It is now enacted that "any one of Her Majesty's principal Secretaries of State may, by order under his hand, authorize the carriage as cargo in any passenger ship, subject to such conditions and directions as may be specified in the order, of naval and military stores for the public service,

7. MISCELLANEOUS.

CENSUS OF 1871.

[33 and 34 Victoriæ, caps. 80, 107, and 108.—August 9, 1870.]

An Act for taking the Census of Ireland. An Act for taking the Census of England. An Act for taking the Census of Scotland.

The three Acts here cited give directions regarding the taking of the census of the United Kingdom. The first statute has reference to Ireland, and is the only one directing the "religious profession" to be stated. The census is to be taken on Monday, the 3rd of April, 1871, by the Dublin Police and the Irish Constabulary, as the Lord Lieutenant shall direct. The information to be obtained in Ireland is as to the persons who shall have been in each house on Sunday, the 2nd of April, as to their sex, age, religious profession, birthplace, and occupation. The next statute, referring to England, gives the Secretary of State for the Home Department the superintendence of taking the census, which is to ascertain the names, sex, age, rank, profession, and occupation. Schedules are to be left at the houses in the week ending the 1st of April, and to be collected on Monday, the 3rd of April. There is no enactment as to a "religious census." In the chapter following is the Act as to Scotland, the words of which are the same as that for England. The object of the law is to obtain accurate information as to the persons abiding in each house on Sunday, the 2nd of April. Penalties are to be enforced for neglect to furnish particulars and for false statements.

POSTAL REGULATIONS.

[33 and 34 Victoriæ, cap. 79.—August 9, 1870.]

An Act for further Regulation of Duties of Postage, and for other Purposes relating to the Post Office.

The Act provides that from and after the 1st of October, 1870, there may be sent by post between places in the United Kingdom, at the rate of one halfpenny—1, a post-card; 2, a book packet, or pattern, or sample packet, not exceeding 2 oz. in weight, or if exceeding 2 oz., then for one halfpenny for every 2 oz. or fractional part of 2 oz.; 3, a registered newspaper (with or without a supplement or supplements); and one halfpenny is to be also the postage on each registered newspaper, with or without supplement or supplements, in a packet of two or more, but the packet is not to be liable to a higher rate of postage than the rate chargeable on a book packet of the same weight. The Postmaster-General, with the approval of the Treasury, is authorized to make regulations as to prepayment, dimensions, and maximum weight of packets, the nature of covers, &c., and such other regulations as from time to time may seem expedient for the better execution of this Act. The new Act repeals from and after the 30th of September five Acts, or parts of them, passed in 1836, 1840, 1848, 1853, and 1855, but the repeal is not to affect, among other things, "any right, title, obligation, or liability accrued before that repeal takes effect." In case of need ordinary letters are to have a preference even over post cards, the Act providing that where the despatch or delivery from a post-office of letters would be delayed by the despatch or delivery therefrom at the same time of book packets, pattern or sample packets, or post cards, they may, subject and according to post-office regulations, be detained in the post-office until

the next despatch or delivery. The Inland Revenue Commissioners have to provide proper dies and other implements for denoting by adhesive, or embossed, or impressed stamps, or otherwise, the postage duties payable under this Act. It will not be lawful to use for a letter, &c., sent by post, an embossed or impressed stamp removed from the paper or card on which it was embossed or impressed, although such stamp has not been before sent by post or used. Newspaper stamps in hand, rendered useless by this Act, will be allowed for as spoilt stamps. Any publication coming within the following description is, for the purposes of this Act, to be deemed a newspaper; that is to say, any publication consisting wholly or in great part of political or other news, or of articles relating thereto or to other current topics, with or without advertisements; but it must be printed and published in the United Kingdom, at intervals of not more than seven days, and printed on a sheet or sheets unstitched, and it must have the full title and date of publication printed at the top of the first page, and the whole or part of the title and the date of publication printed at the top of every subsequent page. The following is, for the purposes of this Act, to be deemed a supplement to a newspaper: that is to say, a publication consisting wholly or in great part of matter like that of a newspaper, or of advertisements, printed on a sheet or sheets, or a piece or pieces of paper, unstitched, or consisting wholly or in part of engravings, prints, or lithographs, illustrative of articles in the newspaper; such publication in every case being published with the newspaper, and having the title and date of publication of the newspaper printed at the top of every page, or at the top of every sheet or side on which any such engraving, print, or lithograph appears. The proprietor or printer of any newspaper within the above description, or of any publication which, regard being had to the proportion of advertisements to the other matter therein, is not within the above description, but which was stamped as a newspaper before the passing of the Act 18 and 19 Victoriæ, cap. 27, may register it at the General Post Office every year, in such form as the Postmaster-General directs, paying a registration fee not exceeding 5*s.*; the Postmaster-General may from time to time revise the register, and remove therefrom any publication not being a newspaper, and his decision, or that of the Treasury, in case of appeal, on the admission to or removal from the register of a publication, shall be final. Every publication for the time being on the register will be deemed a registered newspaper for the purposes of this Act, and will be deemed a newspaper for the purposes of any postal arrangement or convention with a colonial or foreign government. Existing Treasury warrants and Post Office regulations relating to the postage on newspapers, book packets, and pattern or sample packets, passing between the United Kingdom and places out of it, are continued until altered. If any registered or other newspaper, supplement, publication, packet, or post card is sent by post otherwise than in conformity with this Act or any Treasury warrant or Post Office regulations, it is to be either returned to the sender or forwarded to its destination, charged with postage not exceeding letter postage, or without any additional charge, as the Postmaster-General, with the approval of the Treasury, directs. One of the clauses of the Act, reviving a statute of 7 Will. 4 and another of 1 Victoriæ, empowers the Postmaster-General to make regulations for preventing the sending or delivery by post of indecent or obscene books or other articles, or of letters and post cards having on them any words or marks of an indecent, obscene, libellous, or grossly offensive character.

ABSTRACTS OF PARLIAMENTARY AND OTHER OFFICIAL DOCUMENTS.

1. Finance and Taxation.

National Revenue and Expenditure.—The subjoined Tables show the Gross Public Revenue and Expenditure of the United Kingdom in the Financial Year ended the 31st of March, 1870 :—

Sources of Revenue :—	£	s.	d.
Customs	21,529,000	0	0
Excise	21,763,000	0	0
Stamps	9,248,000	0	0
Taxes (Land and Assessed)	4,500,000	0	0
Property Tax	10,044,000	0	0
Post Office	4,670,000	0	0
Telegraph Service	100,000	0	0
Crown Lands (Net)	375,000	0	0
Military and Naval extra Receipts, and Proceeds of Old Stores sold	1,034,509	13	6
Amount received from the Revenues of India on account of British Troops	717,000	0	0
Allowance out of Profits of Bank of England	138,578	0	0
Miscellaneous Receipts	1,315,164	17	0
Total Gross Income	75,434,252	10	6

Branches of Expenditure :—	£	s.	d.
Interest and Management of the Permanent Debt	22,434,760	16	8
Terminable Annuities	4,365,848	8	2
Interest of Exchequer Bonds	89,750	0	0
Interest of Exchequer Bills	149,098	12	7
Interest of Advances for Deficiency	8,874	12	10
Interest of Advances in aid of Ways and Means	5,227	7	9
Consolidated Fund Charges :—			
Civil List	405,941	4	6
Annuities and Pensions	290,405	3	10
Salaries and Allowances	141,711	4	5
Diplomatic Salaries and Pensions	56,096	9	5
Courts of Justice	645,398	5	0
Miscellaneous Charges	190,580	18	3
Supply Services :—			
Army	13,565,400	0	0
Navy	9,757,290	0	0
Abyssinian Expedition	1,300,000	0	0
Miscellaneous Civil Services	9,303,013	16	6
Salaries, Superannuations, &c. of Customs & Inl. Rev.	2,557,802	9	8
Ditto ditto Post Office	2,316,000	0	0
Telegraph Service	60,000	0	0
Post Office Packet Service	1,221,552	9	11
Total Ordinary Expenditure	68,864,751	19	6
Expenses of Fortifications	200,000	0	0
Total Expenditure	£69,064,751	19	6
Excess of Income over Expenditure	£6,369,500	11	0

CUSTOMS AND EXCISE.—The Produce of the two great sources of PUBLIC REVENUE, CUSTOMS and EXCISE, which together contribute considerably more than One Half to the NATIONAL INCOME of the UNITED KINGDOM, was as follows in the Financial Year ended March 31, 1870, the sums representing Gross Receipts:—

CUSTOMS DUTIES.	Great Britain.			Ireland.			United Kingdom.		
	£	s.	d.	£	s.	d.	£	s.	d.
Beer, Spruce	2,138	15	0	0	1	2	2,138	16	2
Beer of other Sorts	1,559	12	10	..			1,559	12	10
Chicory	99,023	18	8	..			99,023	18	8
Cocoa, Cocoa Husks, and Chocolate	29,790	0	4	854	2	4	30,644	2	8
Coffee	345,668	5	4	6,053	3	3	351,721	8	7
Corn, Meal, and Flour	91,798	9	5	15,479	16	0	107,278	5	5
Currants	260,319	19	3	436	11	11	260,756	11	2
Figs	28,428	13	6	91	17	5	28,520	10	11
Ginger, Preserved	1,411	17	9	..			1,411	17	9
Plate, Gold and Silver	4,616	15	5	..			4,616	15	5
Plums, Dried or Preserved, French Plums and Prunelloes	3,208	3	7	111	15	0	3,319	18	7
Potato Flour	279	0	5	3	8	3	282	8	8
Prunes	7,164	10	4	46	1	5	7,210	11	9
Raisins	112,248	4	0	1,422	18	2	113,671	2	2
Sago	385	8	5	..			385	8	5
Spirits, Colonial and Foreign:									
Rum	1,878,274	19	10	55,511	18	2	1,933,786	18	0
Brandy	1,595,526	0	8	116,955	10	4	1,712,481	11	0
Geneva	57,782	6	7	15,584	0	10	73,366	7	5
Of other Sorts	453,516	12	3	21,476	5	11	474,992	18	2
Succades and Confectionery, including all Fruits and Vegetables preserved in Sugar	4,097	0	11	6	11	5	4,103	12	4
Sugar, Unrefined	4,819,741	1	0	75,673	11	11	4,895,414	12	11
Sugar, Refined, and Sugar Candy	615,265	8	7	41,737	1	11	657,002	10	6
Sugar, Molasses	103,736	1	7	21	14	6	103,757	16	1
Tea	2,305,115	0	11	339,936	14	0	2,645,051	14	11
Tobacco and Snuff	5,476,175	13	3	1,192,842	11	10	6,669,018	5	1
Wine	1,327,610	18	0	151,250	17	0	1,478,861	15	0
All other Articles	15,858	4	4	187	10	1	16,045	14	5
Total	19,640,741	2	2	2,035,684	2	10	21,676,425	5	0

EXCISE DUTIES.	Great Britain.			Ireland.			United Kingdom.		
	£	s.	d.	£	s.	d.	£	s.	d.
Chicory	15,847	12	0¼	..			15,847	12	0¼
Hackney Carriages	74,799	6	0	..			74,799	6	0
Licenses	3,531,237	8	1¾	191,233	15	0	3,722,471	3	1¾
Malt	6,336,745	9	2¾	390,072	0	3¾	6,726,817	9	6½
Racehorses	9,521	1	0	..			9,521	1	0
Railways	500,560	11	10½	..			500,560	11	10½
Stage Carriages	33,954	9	10	..			33,954	9	10
Spirits	8,406,966	15	5	3,019,727	1	2	11,426,693	16	7
Sugar	64,500	18	6¼	3,643	6	1¾	68,144	4	8
Total	18,974,133	12	0¼	3,604,676	2	7¼	22,578,809	14	8

The Returns of Customs and Excise Duties here given are somewhat in excess of the sums set down in the first Table under the head of National Revenue, which arises from the non-deduction of Overcharges and Allowances of various kinds.

TAXES.—The following table gives the gross receipts from taxes in the United Kingdom during the financial year ended the 31st of March, 1870:—

	£	s.	d.
Land tax on Lands and Tenements	1,654,724	9	5¾
Duties on Offices and Pensions	237	6	0
ASSESSED TAXES.			
Schedules:			
B. Inhabited Houses	1,674,521	0	1¾
C. Servants	244,462	2	6
D. Carriages	430,331	10	10
E. Horses for Riding	285,233	17	6
F. Other Horses and Mules	168,538	13	6
H. Horse Dealers	17,083	2	0
I. Hair Powder	972	9	6
K. Armorial Bearings	71,227	3	9
Additional 10 per cent. per Act 3 Vict. c. 17	1,708	6	2
Penalties in Law Proceedings, and costs recovered	1,422	16	5½
Miscellaneous	558	17	1½
Total Land and Assessed Taxes	4,551,021	14	11½
Property and Income Tax	10,243,342	1	10
Total Taxes	14,794,363	16	9½

STAMPS.—The following table gives the gross receipts from stamps in the United Kingdom during the financial year ended the 31st of March, 1870:—

	£	s.	d.
Deed-stamps and other instruments, not included under any of the following heads	1,698,813	15	10
Probates of wills and letters of administration	1,915,470	7	0
Bills of exchange	731,009	10	7
Bankers' notes	1,492	5	10
Composition for the duties on the bills and notes of the Banks of England and Ireland, and of country bankers	131,958	18	4
Receipts, drafts, and other 1*d.* stamps	608,540	3	4
Marine insurances	86,936	16	6
Licences and certificates	133,118	5	0
Newspapers and supplements	113,254	15	2
Medicine	72,353	1	3
Legacies and successions	2,970,769	18	2
Fire insurances	465,020	14	8
Gold and silver plate	66,039	0	6¾
Cards	12,303	0	0
Probate Court fee stamps	146,082	17	9
Divorce and matrimonial causes fee stamps	3,244	10	0
Admiralty Court fee stamps	8,807	5	0
Patents for inventions	121,329	0	0
Land registry fee stamps	1,335	10	0
Common Law Court fee stamps	91,433	11	6
Companies' registration fee stamps	9,496	19	0
Public record fee stamps	720	0	0
Copyhold, Inclosure, and Tithe Commission fee stamps	9,011	5	0
Bankruptcy Court fee stamps	27,553	15	9
Chancery Court fee stamps	64,602	4	0
Law fund	9,549	5	6
Chancery fund	4,519	4	5¾
Judgments Registry fund	3,324	17	4
Civil bill fund	13,678	2	6
Registration of deeds fee stamps	11,355	7	7
Record of title fee stamps	38	15	0
Penalties in law proceedings, and costs recovered	11,881	10	10
Miscellaneous	706	12	10¾
Total Stamps	9,545,751	6	4¼

NATIONAL REVENUE FROM 1857 TO 1870.—The following table shows the total gross amounts of the national revenue in each of the fourteen financial years, ended March 31, from 1857 to 1870, as well as the proportion of receipts per head of population of the United Kingdom:—

Years ended March 31.	Amounts of Revenue.	Proportion of Receipts per Head of Population of United Kingdom.
	£	£ s. d.
1857	72,334,062	2 12 1
1858	67,881,513	2 8 3
1859	65,477,284	2 6 3
1860	71,089,669	2 9 10
1861	70,283,674	2 8 11
1862	69,674,479	2 8 3
1863	70,603,561	2 8 4
1864	70,208,964	2 7 9
1865	70,313,437	2 7 7
1866	67,812,292	2 5 7
1867	69,434,568	2 6 5
1868	69,600,218	2 6 2
1869	72,591,991	2 7 9
1870	75,434,252	2 9 3

NATIONAL EXPENDITURE FROM 1857 TO 1870.—The following table exhibits the total amount of national expenditure in each of the fourteen financial years, ended March, 31, from 1857 to 1870, together with the pro-

portion of expenditure per head of population of the United Kingdom:—

Years ended March 31.	Amounts of Expenditure.	Proportion of Payments per Head of Population of United Kingdom.
	£	£ s. d.
1857	75,588,667	2 14 4
1858	68,128,859	2 8 5
1859	64,663,882	2 5 8
1860	69,502,289	2 8 8
1861	72,792,059	2 10 8
1862	71,116,485	2 9 11
1863	69,302,008	2 8 2
1864	67,056,286	2 6 2
1865	66,462,207	2 5 4
1866	65,914,357	2 4 8
1867	66,780,396	2 4 11
1868	71,236,242	2 7 7
1869	72,069,961	2 9 8
1870	68,864,752	2 4 9

THE NATIONAL DEBT.—At the close of the financial year ended the 31st of March, 1870, the funded debt of the United Kingdom amounted to 741,514,683*l.*; the terminable annuities to 4,018,518*l.*, their capital value in 3 per cent. stock being 53,130,380*l.*; and the unfunded debt amounted to 6,761,500*l.* — making the total capital debt reach 801,406,563*l.* Ten years previous, at the close of the financial year, 1859-60, the total was 825,692,772*l.*; the terminable annuities were then little more than two millions, and their capital value not 20 millions; the unfunded debt exceeded 16 millions.

NATIONAL DEBT CHARGES.—The following table, compiled from the 'Finance Accounts for the Financial Year 1869-70,' gives a detailed statement of the last annual charges on account of the National Debt, distinguishing that of Great Britain and of Ireland, and showing the charges accrued on debt created or transferred between the 31st of March, 1869, and the 31st of March, 1870:—

Great Britain.	Annual Charges.		
On 31st March, 1869:—	£	s.	d.
Unredeemed capital . .	21,036,702	13	7½
Annuities, per 18 Vict. c. 18, expiring 5th of April, 1885 . . .	116,000	0	0
Annuities, per 23 & 24 Vict. c. 109, and subsequent Acts, expiring 5th of April, 1885. (Fortifications) . .	389,683	0	0
Annuities, per 26 Vict. c. 14 & 25; 29 Vict. c. 5; and 30 Vict. c. 26, expiring 5th of April, 1885	1,105,633	14	3
Great Britain.	Annual Charges.		
	£	s.	d.
Annuities, per 30 Vict. c. 26, expiring 5th of July, 1885	1,315,203	0	0
Annuities for a limited term of years, per 10 Geo. 4, c. 24, and 3 Will. 4, c. 14, expire at various periods . .	52,876	13	0
Red Sea Telegraph Company's Annuity, 25 & 26 Vict. c. 39 . . .	36,000	0	0
Life Annuities, 48 Geo. 3, c. 142, and subsequent Acts	967.398	9	8
Life Annuities, 18 & 19 Geo. 3, and English Tontine Annuities, 29 Geo 3	12,190	13	5
Irish Tontine Annuities, 13 & 14, 15 & 16, and 19 & 20 Geo. 3 (Irish Acts), payable in Great Britain	15,830	11	0
Management	213,610	7	5
Total debt at 31st of March, 1869 . .	25,261,129	2	4½
Debt created or transferred from 31st of March, 1869, to 31st of March, 1870:—			
Capital transferred from the funded debt in Ireland to the funded debt in Great Britain, 5 Geo. 4, c. 53 (Three per Cents)	27,702	7	9
Capital raised and inscribed for the purposes of the Telegraph Acts, 1868-69, per 32 & 33 Vict. c. 73, ss. 13 and 15 (Three per Cents.)	210,000	0	0
Capitals retransferred from the Commissioners for the Reduction of the National Debt, the dividends upon which had remained unclaimed ten years and upwards, the same having been reclaimed by the proprietors thereof, 56 Geo. 3, c. 60	1,742	16	6½
Annuities for a limited term of years, granted per 10 Geo. 4, c. 24 .	708	7	6
Annuities per 18 Vict. c. 18, expiring 5th of April, 1885, unclaimed, reclaimed	3	15	0
Annuities (expiring 1885), granted per Act 30 & 31 Vict. c. 145 (Fortifications) . .	17,074	0	0

Great Britain.	Annual Charges. £	s.	d.
Annuities for terms of years (expiring at various periods of the year 1885), granted per Act 32 & 33 Vict. c. 59, in lieu of other annuities cancelled (as per contra) . . .	2,412,277	0	0
Life Annuities, granted per 10 Geo. 4, c. 24, 3 Will. 4, c. 14, and 16 & 17 Vict. c. 45 .	55,245	3	10
Contributors' Shares, Tontine 1789, increased	36	13	7
Management payable to Bank of England, increased	236	2	5
Total debt created or transferred in Great Britain, between 31st of March, 1869, and 31st of March, 1870 .	2,725,033	6	7½
General total, Great Britain	27,986,162	8	11½

Ireland.			
On 31st of March, 1869 :—			
Unredeemed Capital. .	1,164,473	10	2½
Management	10,854	18	5
Total debt at 31st of March, 1869 . .	1,175,328	8	7½
Capital transferred from the funded debt in Great Britain to the funded debt in Ireland, 5 Geo 4, c. 53 (Three per Cents.) . . .	22,045	7	4½

Ireland.	Annual Charges. £	s.	d.
Capitals re-transferred from the Commissioners for the Reduction of the National Debt, the dividends on which had remained unclaimed 10 years or upwards, the same having been reclaimed by the proprietors, 23 & 24 Vict. c. 71 (Three per Cents.). . . .	36	6	4½
Total debt created or transferred in Ireland, between 31st of March, 1869, and 31st of March, 1870 . . .	22,081	13	9½
General Total, Ireland .	£1,197,410	2	4½

The following statement gives the summary of the charges on account of the National Debt for the financial year ended the 31st of March, 1870:—

	£	s.	d.
Total unredeemed debt on the 31st of March, 1869:—			
Great Britain . . .	25,261,129	2	4½
Ireland	1,175,328	8	7½
	26,436,457	10	11½
Debt created or transferred between the 31st of March, 1869, and the 31st of March, 1870:—			
Great Britain . . .	2,725,033	6	7½
Ireland	22,081	13	9½
	2,747,115	0	4½
Total	£29,183,572	11	4½

2. Currency.

Coinage of the Royal Mint.—The total value of the coinage issued by the Royal Mint in each of the fourteen years, 1856 to 1869, was as follows :—

Years.	Total. £
1855 ..	9,245,264
1856 ..	6,476,060
1857 ..	5,209,810
1858 ..	1,690,359
1859 ..	3,305,085
1860 ..	3,378,102
1861 ..	8,673,232
1862 ..	8,337,731
1863 ..	7,310,032
1864 ..	10,088,860
1865 ..	2,926,839
1866 ..	5,620,716
1867 ..	723,540
1868 ..	1,971,068
1869 ..	7,469,464

The coinage of recent years has been chiefly gold. To the total amount issued in the year 1869, gold contributed 7,372,204*l.*, silver 76,428*l.*, copper 20,832*l.*

Price of Consols.—A Parliamentary return, issued in the session of 1870, shows the prices of the Three per Cent. Consols for nearly the last half century—namely, the highest, lowest, and mean price for each financial year. Consols were above par in the financial years 1844-45, 1845-46, 1852-53, and 1853-54, and in the year 1852-53 the mean price of the year was above par. On the other hand, the price fell below 75 in 1822-23, 1823-24, 1825-26, and 1830-31. The highest price in the 48 years was 101*l.* 12*s.* 6*d.*, on the 11th of December, 1852; and the lowest was 72*l.*, on the 1st of March, 1823. In the ten years ending the 5th of April, 1870, the highest price was

96*l.* 7*s.* 6*d.*, on the 1st of June, 1867; and the lowest was 84*l.*, on the 11th of May, 1866, at the time of the great commercial panic.

BILLS OF EXCHANGE.—In year 1869 there were 6,234,535 stamps for inland bills of exchange and promissory notes issued and sold by the Revenue Department. The great majority were not for large sums. As many as 872,557 of the stamps were penny stamps, being for bills or notes not exceeding 5*l.*; 601,894 were twopenny stamps, for bills or notes exceeding 5*l.*, but not exceeding 10*l.*; 1,514,905 were threepenny stamps, for bills or notes exceeding 10*l.*, but not exceeding 25*l.*; 1,226,818 were sixpenny stamps, for bills or notes exceeding 25*l.*, but not exceeding 50*l.* Thus two-thirds of the inland bills of exchange and promissory notes of the year were for sums not exceeding 50*l.* The highest bill or note stamp issued in the year was one of 32*l.* 10*s.*, which is the stamp for a bill or note for a sum exceeding 64,000*l.*, but not exceeding 65,000*l.* The stamps issued in the United Kingdom for foreign bills in 1869 were nearly three millions in number. The gross produce of the year's stamp duty on bills of exchange and promissory notes was 334,936*l.* on inland, and 342,283*l.* on foreign bills and notes.

LONDON BANKERS' CLEARING HOUSE.—The total amount of checks and bills paid at the Clearing house during the year ended the 30th of April, 1870, was 3,720,623,000*l.*, representing an increase of 186,584,000*l.* over 1869, and of 463,212,000*l.* over 1868. The amounts passing through on the 4ths of the month are admitted to form the best indication as to the state of the internal trade of the country; the total of these for 1870 was 168,523,000*l.*, showing an increase of 6,662,000*l.* over 1869, and of 21,410,000*l.* over 1868. The payments on the 24 Stock Exchange settling days for 1870 amounted to 594,763,000*l.*, showing an increase of 44,141,000*l.* over 1869, and of 150,320,000*l.* over 1868. The payments on the 12 Consol settling days for the same period have amounted to 148,822,000*l.*, representing an increase of 6,552,000*l.* over 1869, and an increase of 16,529,000*l.* over 1868.

3. GENERAL COMMERCE AND NAVIGATION.

IMPORTS INTO THE UNITED KINGDOM.—The following table gives the value of imports into the United Kingdom from foreign countries, calculated at the official rates of valuation, in the year ended the 31st of December, 1869:—

Imports.	Value. £
Almonds of all sorts.	100,894
Animals living; viz.:	
Oxen, Bulls, Cows and Calves	377,780
Sheep and Lambs	161,833
Arrow Root	290,855
Ashes, Pearl and Pot	111,184
Bacon and Hams.	1,668,029
Bark for Tanning or Dyeing	116,530
„ Peruvian	157,248
Beads and Bugles of Glass	96,024
Beef, Salted or Fresh	205,774
Bones of Animals and Fish	455,905
Books, Bound or Unbound	92,931
Borax	415,217
Brimstone.	525,236
Butter.	1,908,281
Candles	202,190
Caoutchouc	407,427
„ Manufactures of	73,136
Cheese.	1,462,505
Chicory	84,893
China and Porcelain Ware	180,626
Cinnamon.	537,666
Clocks	319,008
Watches	199,207
Cloves.	1,202,731
Cochineal, Granilla and Dust	3,177,703
Cocoa and Chocolate.	337,658
Coffee	10,826,132
Coir Rope, Twine, Strands and Yarn	237,179
Copper Ore and Regulus	278,519
Copper, Unwrought and part Wrought	3,509,093
Cork	126,942
Corks, ready made	242,506
Corn, Meal and Flour	26,089,616
Cotton Manufactures of Asia	185,038
—— —— —— Europe	1,097,962
Cream of Tartar	124,103
Currants	991,556
Dye and Hardwoods; viz.:—	
Barwood	96,030
Brazil Wood	404,635
Fustic	111,142
Logwood	577,316
Mahogany	439,984
Eggs	138,584
Embroidery and Needlework	92,340
Figs	67,742
Fish	717,576
Flax, Dressed or Undressed	3,453,774
Flowers, Artificial	365,407
Gambier and Cutch	395,640
Glass of all Sorts.	2,883,684
Guano.	2,100,100
Gum:—	
Animi and Copal	152,650
Arabic	150,204
Shellac	193,956
Hair and Goats' Wool, Manufactures of	69,670
Hair, Horse	69,499
Hemp, Dressed or Undressed, including Jute.	3,289,210
Hides, Raw or Tanned	2,883,094
Hops	1,206,741
Indigo.	1,182,257
Iron in Bars, Unwrought	668,139
Iron and Steel, Wrought and Manufactured	661,286
Lace	276,620
Lard	398,268

Imports.	Value. £
Lead, Pig and Sheet	790,245
Leather Boots, Shoes, Calashes and Boot Fronts	88,470
Leather Gloves	279,461
Linens	131,091
Liquorice Juice and Paste	171,443
Madder, Madder Root, and Garancine	1,421,774
Manganese, Ore of	206,068
Musical Instruments	219,624
Naphtha, Petroleum, &c.	396,916
Nutmegs	161,946
Oil:—	
Castor	562,498
Essential and Perfumed	218,451
Cocoa Nut	779,691
Olive	961,408
Palm	814,537
Seed of all kinds	377,380
Train, Spermaceti, & Blubber	282,103
Of Turpentine	171,445
Oil Seed Cake	755,326
Oranges and Lemons	436,357
Paper of all kinds	837,062
Pepper	302,405
Pimento	83,645
Pitch and Tar	187,879
Plumbago	377,660
Pork, Salted or Fresh	193,527
Potatoes	812,481
Poultry and Game	178,481
Pyrites of Iron and Copper	856,962
Quicksilver	505,350
Rags, &c., for Paper	479,200
Raisins	276,251
Rhubarb	169,142
Rice, Cleaned or in the Husk	4,074,519
Rosin	319,625
Sago	555,128
Saltpetre and Cubic Nitre	1,044,263
Seeds:—	
Canary	357,473
Clover	151,999
Cotton	802,470
Flaxseed and Linseed	1,542,170
Rape	268,865
Shumac	86,026
Silk:—	
Raw, and Waste	2,459,188
Thrown	830,237
Manufactures of Asia	84,419
Manufactures of Europe	10,110,368
Silver Ore	178,398
Skins and Furs	622,715
Spirits:—	
Brandy	534,443
Rum	450,489
Other sorts	204,331
Sugar:—	
Raw and Refined	17,830,822
Molasses	623,990
Tallow	1,320,644
Tea	13,922,330
Teeth, Elephants'	83,130
Tin	543,798
Tobacco and Snuff	608,262
Toys	272,128
Valonia	126,828
Wax, Bees'	70,575
Wines	1,936,316
Wood and Timber; viz.:—	
Deals, Battens, &c.	670,332
Timber, not Sawn or Split	1,452,980
Staves	46,599
Wool:—	
Cotton	37,924,584
Sheep and Lambs'	6,731,258
Woollen Manufactures	2,534,523
Yarn, Woollen or Worsted, and Yarn of Silk and Worsted	1,697,014
Zinc or Spelter	1,546,900
All other Articles	13,590,417
TOTAL Value of Imports from Foreign Countries	£22,4319,500

EXPORTS OF HOME PRODUCE FROM THE UNITED KINGDOM.—The following table gives the value of the exports of the produce and manufactures of the United Kingdom, according to the real, or declared value, in the year ended the 31st December, 1869:—

Articles of Home Produce.	Value. £
Agricultural Implements	236,108
Alkali of all sorts	1,379,108
Alum	56,509
Apparel, Slops, and Negro Clothing	2,392,317
Arms and Ammunition	1,128,544
Bacon and Hams	99,812
Bags, Empty	946,378
Beef and Pork, Salted	20,492
Beer and Ale	1,892,716
Bleaching Materials	176,193
Books, Printed	676,459
Brass and Copper Manufactures	3,585,589
Bread and Biscuit	192,471
Bricks	89,569
Butter	270,366
Cabinet and Upholstery Wares	249,521
Candles	181,918
Caoutchouc and Gutta Percha Manufactures	650,394
Carriages	165,365
Cement	385,201
Cheese	109,943
Coals and Culm	5,067,790
Confectionery	75,810
Cordage	223,074
Corn, Meal, and Flour	360,450
Cotton:—	
Yarn	14,095,449
Manufactures	53,021,505
Drugs and Chemical Products	1,294,926
Earthenware of all sorts	1,770,110
Fish of all sorts	859,765
Fishing Tackle	77,856
Fuel, Manufactured	97,878
Glass of all sorts	886,606
Haberdashery and Millinery	4,584,955
Hardwares and Cutlery	4,388,651
Hats:—	
Felt	325,186
Of all other sorts	186,286
Hemp, Dressed	75,814
Hops	70,665

Articles of Home Produce.	Value. £
Horses	135,237
Iron and Unwrought Steel	19,480,950
Jute Manufactures	869,492
Lard	8,419
Lead and Shot	1,050,429
Lead :—	
Red	70,697
White	153,452
Leather :—	
Wrought and Unwrought	2,309,231
Saddlery and Harness	321,516
Linen :—	
Yarn	2,332,088
Manufactures	6,800,141
Machinery and Mill-work	5,118,922
Mathematical and Optical Instruments	69,453
Molasses	8,707
Musical Instruments	172,832
Oil, Hempseed, Linseed, and Rapeseed	1,328,544
Oil, Train, and Spermaceti	27,355
Painters' Colours and Materials	653,451
Paper of all sorts	727,071
Perfumery	102,198
Pickles and Sauces	406,827
Plate, Ware, Jewelry, and Watches	506,662
Plaiting, of Straw, Chip, and Willow	26,052
Potatoes	7,602
Provisions, not otherwise described	343,879
Salt	430,592
Saltpetre, refined in the United Kingdom	75,944
Seeds of all sorts	116,513
Silk Manufactures	2,260,155
Soap	216,226
Spirits	209,953
Stationery other than Paper	497,557
Sugar, Refined	549,761
Tin :—	
Unwrought	590,938
Plates	2,304,820
Tobacco (Manufactured) and Snuff	81,988
Toys	101,475
Turnery and Turners' Wares	33,249
Twine	106,291
Umbrellas and Parasols	185,306
Wool :—	
Sheep's	922,159
Of other sorts	135,302
Woollen and Worsted Yarn	5,858,777
Woollen Manufactures	22,631,848
Zinc, Wrought and Unwrought	207,840
All other Articles	7,058,307
TOTAL Value of the Produce and Manufactures of the United Kingdom exported to Foreign Countries	189,953,957

EXPORTS OF FOREIGN AND COLONIAL PRODUCE FROM THE UNITED KINGDOM.—The following table gives the value of the exports of foreign and colonial produce from the United Kingdom in the year ended the 31st of December, 1869 :—

Articles of foreign and Colonial Produce.	Value. £
Almonds, of all sorts	57,240
Ashes, Pearl and Pot	11,185
Bark, Peruvian	263,558
Caoutchouc	96,841
Cassia Lignea	54,443
Cinnamon	432,431
Cloves	1,011,237
Cochineal, Granilla and Dust	3,058,790
Cocoa, Cocoa-nut Husks and Shells, and Chocolate	179,309
Coffee	8,005,433
Copper, Unwrought and part Wrought	1,666,580
Corn, Meal, and Flour	85,243
Cotton Manufactures of India	61,612
——————— of Europe	224,447
Currants	250,881
Dye and Hardwoods, viz. :—	
Barwood	4,698
Fustic	17,442
Logwood	92,974
Flax	96,751
Guano	25,170
Gum Animi and Copal	102,167
Hair or Goats' Wool, Manufactures of	8,920
Hemp	638,617
Hides, Raw and Tanned	918,897
Indigo	1,305,673
Iron in Bars, Unwrought	274,719
Lead, Pig and Sheet	13,680
Linens	29,034
Mace	41,429
Molasses	50,958
Nutmegs	123,458
Oil :—Castor	97,362
Cocoa Nut	515,819
Olive	115,120
Palm	384,480
Train, Spermaceti, & Blubber	10,164
Pepper	800,406
Pimento	54,413
Quicksilver	786,488
Raisins	54,129
Rhubarb	178,123
Rice, Cleaned or in the Husk	1,824,513
Saltpetre and Cubic Nitre	413,874
Seeds :—	
Flax and Linseed	30,561
Rape	83,298
Silk :—	
Raw, Thrown, and Waste	2,555,507
Manufactures of India	25,498
Manufactures of Europe, &c.	109,957
Skins and Furs	310,880
Spelter	150,100
Spirits :—	
Brandy	118,495
Geneva	26,584
Rum	435,758
Unenumerated, not sweetened	63,935
Of various sorts (mixed in Bond)	418,369
Sugar :—	
Unrefined	602,305
Foreign, refined and Candy	63,060
Tallow	72,569

Articles of Foreign and Colonial Produce.	Value. £
Tea	5,024,799
Tin	144,580
Tobacco and Snuff	311,217
Wines	359,046
Wool:—	
Cotton	17,420,129
Sheep's (including Alpaca and the Llama tribe)	8,016,821
Woollen Manufactures	182,255
All other Articles	6,063,215
TOTAL Value of Foreign and Colonial Merchandise Exported from the United Kingdom to Foreign Countries	67,087,666

NAVIGATION RETURNS FOR 1869.—The subjoined table exhibits the number and tonnage of vessels which entered inwards and cleared outwards in the United Kingdom, *with cargoes*, to and from various countries, in the year ended the 31st December, 1869:—

Entered from	Vessels.	Tons.
1. British Possessions:		
In North America	1,841	1,105,329
„ East Indies including Ceylon, Singapore, and Mauritius	977	872,528
„ Australasia	200	175,855
„ West Indies	600	192,238
„ All other parts	1,898	393,064
TOTAL	5,516	2,739,014
2. Foreign Countries:		
Russia—Northern Ports	3,696	933,114
Russia—Southern Ports	938	366,548
Sweden	3,332	778,549
Norway	3,429	647,823
Denmark	1,062	126,784
Prussia	2,021	490,708
Schleswig-Holstein and Lauenburg	226	67,727
Former Hanover	280	45,617
Hanse Towns	1,626	735,683
Netherlands	2,895	724,978
Belgium	2,496	615,109
France	8,549	1,347,397
Spain	1,676	436,287
Portugal	1,122	240,949
Italy—Sardinia	287	111,551
Two Sicilies	361	82,971
Austria	327	167,856
Turkish Dominions including Wallachia and Moldavia	1,322	523,564
Other European States	516	129,934
Egypt	449	346,591
United States	1,792	1,638,699
Mexico, Foreign West Indies, and Central America	715	298,904
Brazil	636	212,365
Peru and Chili	359	254,790
Other States in America, Africa, and Asia	954	422,433
TOTAL	41,066	11,746,931
TOTAL	46,582	14,485,945

Cleared for	Vessels.	Tons.
1. British Possessions:		
In North America	1,004	606,680
„ East Indies, including Ceylon, Singapore, and Mauritius	1,145	1,014,860
„ Australasia	400	357,263
„ West Indies	450	153,123
„ All other Parts	2,329	672,998
TOTAL	5,328	2,804,924
2. Foreign Countries:		
Russia—Northern Ports	2,610	689,289
Russia—Southern Ports	325	154,312
Sweden	1,324	322,063
Norway	1,431	232,775
Denmark	3,110	422,767
Prussia	2,809	658,435
Schleswig-Holstein and Lauenburg	909	113,296
Former Hanover	678	52,805
Hanse Towns	2,808	979,149
Netherlands	2,789	727,613
Belgium	2,485	606,397
France	12,740	2,272,257
Spain	1,788	500,321
Portugal	926	213,352
Italy—Sardinia	751	322,109
Two Sicilies	615	172,123
Austria	468	194,548
Turkish Dominions, including Wallachia and Moldavia	860	347,214
Other European States	738	197,282
Egypt	971	552,071
United States	1,879	1,858,504
Mexico, Foreign West Indies, and Central America	905	366,994
Brazil	880	321,173
Peru and Chili	340	212,157
Other States in America, Africa, and Asia	1,543	625,957
TOTAL	46,682	13,114,963
TOTAL	52,010	15,919,887

MERCHANT SHIPPING.—At the end of the year 1869 there were remaining on the registers of the United Kingdom, including the Channel Islands, 24,187 sailing vessels of 4,765,304 tons, and 2972 steam vessels of 948,367 tons; these numbers, as compared with those for the end of the year 1868, show an increase of 46,070 tons in the steam tonnage, but a decrease of 112,929 tons in the sailing tonnage. The British Possessions show at the end of 1869, 11,347 sailing vessels of 1,386,012 tons, and 566 steam vessels of 82,975 tons, being an increase of 5021 tons in the sailing tonnage, and of 8371 tons in the steam tonnage. The total for the British empire, therefore, at the end of 1869, was 35,534 sailing vessels of 6,151,316 tons, and 3538 steam vessels of 1,031,342 tons, being an increase of 54,441 tons in the steam tonnage, but a decrease of 107,908 tons in the sailing tonnage. The grand total of sailing vessels and steam vessels on the registers of the empire at the end of 1869 was 39,072 vessels of 7,182,658 tons, showing, as compared with the end of 1868, a decrease of 1265 in the number of vessels, and of 53,467 tons in the tonnage. The tonnage on the register of the port of London at the close of the year 1869 was 1,087,589 tons, as much as 267,059 being steam tonnage; at Liverpool, 1,484,973 tons, 237,900 being steam tonnage; Clyde ports, 535,490 tons, 120,066 being steam tonnage; Tyne ports, 379,732 tons, 40,017 being steam tonnage; Sunderland, 244,056 tons, 31,698 being steam tonnage; Hull, 104,804 tons, 67,317 being steam tonnage; Aberdeen, 103,248 tons, 5,319 being steam tonnage. Canada, with Newfoundland and Prince Edward Island, shows on the registers 882,709 tons, 31,220 being steam tonnage; Australasia and New Zealand, 205,704 tons, 29,319 being steam tonnage; India, 139,499 tons, 7624 being steam tonnage. Of the whole mercantile tonnage of the British empire at the close of the year 1869, 15,997 vessels, of 473,191 tons, were vessels not exceeding 50 tons; and 23,075 vessels, of 6,709,467 tons, were vessels exceeding 50 tons. In the year 1869, 1012 vessels, of 368,576 tons, were placed on the registers of ports of the United Kingdom, viz., 731 sailing vessels, of 245,373 tons, and 281 steam vessels, of 123,203 tons; 1032 vessels, of 293,297 tons, were sold and transferred in the year; 755, of 202,482 tons, were wrecked; and 57, of 8597 tons, were broken up. These statistics are drawn from a Parliamentary return issued in the session of 1870, signed by the Registrar-General of Shipping and Seamen.

COMMERCE OF THE CHIEF PORTS.—Of the gross Customs revenue received in 1869: namely, 22,224,203*l.*, there was collected in the port of London 10,484,555*l.*, being 209,939*l.* less than in 1868; 3,158,300*l.* in Liverpool, an increase of 78,734*l.* over 1868; 3,413,027*l.* in the other ports of England, an increase of 65,841*l.*; 3,073,045*l.* in Scotland, a decrease of 363,263*l.*; and 2,095,276*l.* in Ireland, a decrease of 40,677*l.* The largest deficiency was in the revenue collected in the Scotch ports; next to this was the falling off in London, the largest experienced at that port since the year 1866, when the abolition of the timber duties and the reduction of the tea duties in June, 1865, contributed to create the deficiency. Liverpool, on the contrary, presented a very satisfactory increase, said to have arisen on the greater consumption of the articles of sugar and tobacco. The other ports in England also improved their collective returns, while the Irish ports showed a falling off of about 2 per cent on their revenue of 1868. Out of 84 English ports next in importance to London and Liverpool, 35 showed an increase and 49 a decrease. Bristol showed an increase of 63,422*l.*; Grimsby, of 39,441*l.*; Newcastle, of 30,642*l.*; Sunderland, 8474*l.*; Leeds, 7437*l.*; Hull, 6645*l.* Plymouth showed a decrease of 25,928*l.*, owing to the failure of a sugar refinery; Gloucester, of 20,477*l.*, attributed to the abolition of the duty on corn; Manchester, 8847*l.*; Hartlepool, 8131*l.*; Chester, 7818*l.*; Preston, 6267*l.* Of the Scotch ports, eight showed an increase and 18 a decrease. Granton, which was only raised to the rank of a port in 1866, was the only port which showed an increase of any magnitude (3000*l.*) caused by a general increase of trade. Glasgow showed a decrease of 179,575*l.*, caused by the stoppage of a sugar refinery; Greenock of 104,042*l.*, owing to the refineries being partially closed in August and September for want of water; Leith of 67,641*l.*, caused by the abolition of the duty on corn. Of the Irish ports, six showed an increase and 13 a falling off. Of the former, Cork added the sum of 12,000*l.* to the increase shown in the last report in consequence of a steady advance in the trade of that city, and Limerick more than made up the falling off recorded for 1868, having exceeded the receipt of that year by 6900*l.* The principal decreases were at the following places:—Waterford, of 14,950*l.*, owing to tobacco having been removed, duty paid from Dublin; Londonderry, 13,918*l.*, in consequence of duty having been paid on wines and spirits through the Inland Revenue Department; Dublin, 12,225*l.*, owing to smaller quantities of manufactured tobacco having been sent to England; Belfast, 9796*l.* owing to the abolition of the duty on corn; Sligo, 5377*l.*, principally on tobacco and grain. Both in 1868 and 1869 the customs revenue of London was equal to that of all the other ports of Great Britain taken together, and five times that of the whole of Ireland.

SEAMEN AND APPRENTICES.—The latest official returns, referring to the year 1868, show that in that year there were employed in British ships, registered in the United Kingdom, 177,239 British seamen (including all capacities except masters) and 20,263 foreign seamen; the number of apprentices bound and registered in British ships was 4,975. In 1867 the number of foreign seamen was 21,817; in 1865, 20,280. The number of apprentices was 5638 in 1865, 5454 in 1866, and 5444 in 1867. The statistics of preceding years show a gradual decrease in the number of apprentices.

SHIP BUILDING.—A return prepared by the Board of Trade shows the number and tonnage of vessels above 50 tons built at the several ports of the United Kingdom in the three years 1867 to 1869. The tonnage of such vessels built at Glasgow was 52,865 tons in 1867, 70,390 in 1868, 76,312 in 1869; at Sunderland, 47,625, 64,374, and 65,905 tons in the three years respectively; at Liverpool, 12,475, 30,257, and 41,577 tons respectively; at Newcastle, 15,464, 19,031, and 25,743 tons; at Port Glasgow, 11,709, 14,022, and 17,003 tons; at Greenock, 8532, 16,819, and 14,487 tons; at Stockton, 3674, 4762, and 12,287 tons; at Aberdeen, 9199, 7924, and 9691 tons; at Hull, 7266, 8186, and 8498 tons; at Dundee, 4757, 5220, and 7055 tons; at Belfast, 6071, 3093, and 5041 tons; at Middlesborough, 818, 1743, and 4799 tons; at London, 3644, 6607, and 3872 tons; at Hartlepool, 2515, 2374, and 3817, and at West Hartlepool, 2611, 1458, and 2787 tons; at Shields, 2094, 2626, and 2880 tons, and at South Shields, 1452, 2099, and 1632 tons; at Banff, 2475, 2630, and 2198 tons; at Waterford, 1364, 805, and 2178 tons; at Perth, 2305, 1733, and 2137 tons. The other returns are below 2000 tons in 1869.

CASUALTIES ON THE COAST IN 1869.—The Board of Trade return arranges in four classes the wrecks and casualties on the coasts of the United Kingdom occasioning loss of life in 1869. Eighty-one vessels, tonnage 11,881 tons, and crews 553 in number, foundered; 50 of the vessels were laden, 22 in ballast, 9 unknown; 79 were total losses, 2 were cases of partial damage; 435 lives were lost; official inquires were held in 3 cases. The next class consists of strandings, and includes 69 vessels, of 14,913 tons, and also with 553 men; 45 of these vessels were laden, 19 in ballast, 5 unknown; 64 were total losses, 5 partial damage; 288 lives were lost; in one case an official inquiry was held. Next come collisions. This list shows 25 vessels, of 4696 tons, with 215 men; 17 of the vessels were laden, 5 in ballast, 3 unknown; 19 were total losses, 6 partial damage; 118 lives were lost; no official inquiry was held. Last come casualties from other causes than the above three; 36 vessels, of 4571 tons, are in this list, the number of men 245; 20 vessels were laden, 15 in ballast, 1 unknown; 4 were total losses, 32 partial damage; 92 lives were lost; no official inquiry was held. The total, therefore, is 211 vessels, of 36,061 tons, with 1566 men; 132 of the vessels were laden; 166 were total losses, 45 partial damage; 933 lives were lost. An official inquiry was held in only four cases. Ten passengers were among those who lost their lives.

4.—TRADE AND AGRICULTURE.

THE CATTLE TRADE.—During the year 1869 a total of 999,100 head of cattle of all kinds were imported into the United Kingdom, consisting of 167,577 oxen and bulls, 23,097 cows, 29,516 calves, 691,472 sheep, 18,371 lambs, and 69,067 swine and hogs. Of the total number, 593,218 head were received in London, 146,881 at Harwich, 54,575 at Newcastle, 44,766 at Hartlepool, 28,742 at Grimsby, 21,447 at Southampton, and 13,693 at Leith.

CORN IMPORTS.—The Board of Trade returns state the following as the imports into the United Kingdom from harvest to harvest, 1869-70, that is to say, from the end of August, 1869, to the end of August, 1870:—Wheat, 37,285,200 cwt.; wheat flour, 5,631,975 cwt.; barley, 7,785,286 cwt.; oats, 11,458,302 cwt.; peas, 1,986,195 cwt.; beans, 1,695,754 cwt.; Indian corn, 17,616,200 cwt.; making a total of 83,458,912 cwt., equal to 21,522,917 quarters.

FOREIGN SUPPLIES OF GRAIN AND FLOUR.—It appears from the monthly returns of the Board of Trade that during the first half of the year 1870 the importations of wheat into the United Kingdom amounted to 13,843,124 cwt., being a total of 14 per cent. in excess of the quantity imported in the same six months of 1869, but 22 per cent. less than that of the first six months of 1868. The supplies from the United States continued to show a rapid increase, and in 1870 constituted 44 per cent. of the whole, while in 1869 they amounted only to 30 per cent., and in the previous year to 22 per cent. From Russia also the supplies increased in 1870, but only to a moderate extent. In 1869 they were about 28 per cent. of the whole, being nearly equal to the American, and in 1870 they were 33 per cent., while the American were 44 per cent. Germany in 1870 contributed only 12 per cent. against 23 per cent. in 1869, and France was unable to spare anything. The importations from Turkey and Egypt also diminished in 1870. Annexed is a list of the several countries whence we obtain our grain supplies, coupled with a statement of the percentage proportion received from each:—

	Six months ended June 30.	
	1869.	1870.
Total importation, cwt.	12,194,021	13,843,124
Percentage from each country.		
	1869.	1870.
Russia	28	33
Denmark	2	2
Germany	23	12
France	1	—
Illyria, Croatia, and Dalmatia	4	—
Turkey and Principalities	6	2
Egypt	3	1
United States	30	44
Chili	1	1
British North America	1	4
Other countries	1	1
	100	100

The subjoined table shows the importation of flour during the first six months of 1869 and 1870:—

	1869.	1870.
Total importation, cwt.	1,817,580	2,476,192
Percentage from each country.		
Germany	15 ..	17
France	38 ..	22
United States	19 ..	45
British North America.	2 ..	3
Other countries . . .	26 ..	13
	100	100

As regards other grain the importations of the first six months of 1870 was as follows:—Barley, 3,824,222 cwt., or 8 per cent. less than in the same half of 1869; oats, 4,467,633 cwt., or 89 per cent. more than in 1869; peas, 879,425 cwt., or 135 per cent. more than in 1869; beans, 768,002 cwt., or 20 per cent. less than in 1869; and Indian corn, 6,498,538 cwt., or 2 per cent. less than in 1869.

MALT.—The number of bushels of malt charged with duty in 1869 was, in England, 44,211,245; in Scotland, 2,309,142; and Ireland, 2,879,875. The amount of duty charged was, in England, 5,996,150*l.* 19*s.* 5¾*d.*; in Scotland, 312,100*l.* 5*s.* 11*d.*; and in Ireland, 390,311*l.* 8*s.* 6½*d.* The quantity of barley imported into the United Kingdom in 1869 was 8,053,660 cwts., equivalent in quarters to 2,255,025.

HOPS.—The Parliamentary return annually moved for by Mr. Locke shows that for the year ending the 30th of September, 1869, there were 362,455 cwts. of foreign hops imported into the United Kingdom, chiefly from the continent of Europe, but as many as 117,102 cwts. from the United States. The total is above 60,000 cwts. more than in the preceding year. The export of British hops was smaller than in the preceding year, and amounted to only 14,266 cwts. The chief export is to Australasia.

HOME-MADE SPIRITS.—An annual return prepared in the Inland Revenue Office shows that in the year 1869 there were 26,984,267 gallons of proof spirits distilled in the United Kingdom, namely, 7,193,860 gallons in England, 13,567,794 gallons in Scotland, and 6,222,613 gallons in Ireland. Duty was paid on 22,519,817 gallons, the duty amounting to 11,259,910*l.*; 21,621,590 gallons were taken for consumption in the United Kingdom, and paid 10,810,795*l.* duty; 1,555,106 gallons were permitted from distillers' stocks and duty-free warehouses to Customs' warehouses for exportation, ships' stores, &c., and 12,959*l.* paid for drawback or allowance thereon. Furthermore, 578,038 gallons of British compounded spirits were permitted from rectifiers' stocks, and 296,090 paid for drawback or allowance thereon; 671,150 gallons of methylated spirits were sent out by licensed sellers, and 160,094*l.* paid for drawback or allowance. At the close of the year 1869 there were 13,491,314 gallons of proof British spirits in bonded stores in the United Kingdom.

SUGAR.—Returns annually made by the Custom House show that in the year 1869 there were 12,102,593 cwt. of sugar and sugar candy imported into the United Kingdom, and 11,739,093 cwt. were retained for consumption. The duties, ranging from 8*s.* per cwt. on fourth-class of unrefined sugar, to 11*s.* 3*d.* on first-class and 12*s.* on refined sugar and sugar candy, produced a net revenue of 5,388,652*l.* The average price, exclusive of duty, was 26*s.* per cwt. for Muscovado sugar from British West India, and 21*s.* 4*d.* for British East India; for Havannah sugar, ordinary yellow, 27*s.* 7*d.*; 7,755,656 cwt. of sugar were imported from foreign countries, and 4,257,570 cwt. from British possessions; 3,341,794 cwt. came from the British West Indies and British Guiana, 930,286 cwt. from Trinidad, 587,289 cwt. from Demerara, 449,475 cwt. from Jamaica, 408,404 cwt. from Barbadoes, 397,870 cwt. came from British India, 93,390 cwt. from the Straits Settlements, 424,515 cwt. from Mauritius. These quantities were almost entirely unrefined sugar. 2,875,053 cwt. came from Cuba, 1,399,864 cwt. from Brazil, 759,019 cwt. from the Philippine Islands; and all these quantities also were almost entirely unrefined sugar. 908,590 cwt. were received from France, and 594,485 cwt from Holland, more than half of both quantities refined; and 436,197 cwt. from the Hanse Towns, chiefly unrefined sugar.

COPPER AND OTHER MINERALS.—In the year 1869 there were 42,569 tons of British copper exported from the United Kingdom: namely, 12,116 tons unwrought in bricks, pigs, &c.; 28,875 tons sheets, nails, &c.; 735 tons coin, 64 tons wire, 779 tons wrought copper of other sorts. There was a large export to India, and a considerable quantity went to European countries. The imports of foreign copper into the United Kingdom in 1869 included 72,190 tons of ore, 38,769 tons regulus, 6666 tons unwrought in bricks, pigs, &c.; 24,794 tons part wrought—viz., bars, rods, ingots, &c., hammered or raised; 216 tons plates and sheets, and 13,508 tons copper manufactures and copper plates, of which 2637 tons were exported. The exports of tin from the United Kingdom in 1869 amounted to 5082 tons British and 1112 tons foreign; 1141 tons of British tin were exported to the United States. The imports comprised 5440 tons of tin, and 533 tons of tin ore and regulus; the Straits Settlements supplying 3540 tons of the tin. The export of British zinc or spelter in 1869 amounted to 10,145 tons, sent chiefly to India and France, and 280 tons of zinc ore; the export of foreign zinc amounted to 3002 tons. The import comprised 30,938 tons of zinc, 41,736 tons of ore of zinc, and 1778 tons of oxide of zinc. The exports of British lead in 1869 comprised 40,242 tons pig, 6254 tons rolled and sheet, 1869 tons piping and tubing, 3323 tons shot, 879 tons litharge, 3300 tons red lead, 5790 tons white lead. A large portion

of the pig export goes to China. The year's import, chiefly from Spain, Sardinia, and Greece, comprised 52,683 tons lead, pig and sheet, 11,874 tons lead ore, 89 tons red lead, 1429 tons white lead. The above returns show, generally, an increase in the exports of British minerals over the quantity in the preceding year.

THE COAL TRADE OF 1869.—The quantity of coal, including cinders and culm, carried coastwise in the United Kingdom, from port to port, in the year 1869, was 10,452,135 tons, being 123,140 tons less than in the preceding year. Of the whole quantity 2,327,733 tons were shipped at Newcastle, and 2,118,125 tons at Sunderland; 835,499 tons at Hartlepool; 889,212 tons at Cardiff; 774,093 tons at Newport. 2,873,688 tons were brought coastwise to London in 1869, a decrease of above 107,000 tons compared with the previous year; and 3,353,396 tons by inland navigation and by railway, an increase of above 358,000 tons. 10,588,425 tons, of the value of 5,067,790*l.*, were exported to foreign countries and British possessions abroad, a decrease of 249,379 tons, and of 284,735*l.* in declared value. 2,674,405 tons were shipped from Newcastle; 2,189,460 tons from Cardiff; 1,209,806 tons from Sunderland; 618,425 tons from Hartlepool; 498,324 tons from Swansea; 330,052 tons from Newport; 569,362 tons from Liverpool; 325,178 tons from North Shields, and 139,995 tons from South Shields. 1,999,920 tons were exported to France; 642,562 tons to Russia; 558,955 tons to Denmark, including Iceland; 540,344 tons to Prussia; 737,956 tons to Hamburg; 511,337 tons to Spain and the Canaries; 674,655 tons to Italy; 478,163 tons to Egypt; 320,756 tons to British India; 115,137 tons to British and 370,551 tons to foreign West Indies; 235,909 tons to Brazil; 168,062 tons to Uruguay; 195,070 tons to British North America, 28,093 tons of patent fuel (from Welsh ports) were carried coastwise in 1869, and 156,520 tons of the declared value of 97,878*l.*, were exported, both of them larger quantities than in the preceding year.

HORSES.—Among the returns which have been obtained by the Board of Trade from occupiers of land in Great Britain holding not less than a quarter of an acre is a statement of the number of horses in their possession at Midsummer, 1869. The total number shown by these returns is 1,461,061, and it is estimated that to these should be added a further number of half a million for horses in the metropolis and other towns. This brings the total number of horses in Great Britain to about 2,000,000, which is eight to every 100 of the population. The enumerated horses, the horses in the possession of occupiers holding from a quarter of an acre of land upwards, are nearly five (4·8) to every 100 acres under crops of any kind, bare fallow, and grass. In England the numbers shown by the returns are 995,437 horses two years old or more, and 146,559 under two years, making together 1,141,996, or 4·9 for every 100 acres under crops, &c., as above mentioned; in Wales, 102,784 two years old or more, and no less than 29,181 under two years, making together 132,165, or 5·2 per 100 acres under crops, &c.; in Scotland, 166,360 two years old or more, and only 20,540 under two years, making together 186,900, or 4·2 per 100 acres under crops, &c. The totals for Great Britain, therefore, are 1,264,581 horses two years old or more, and 196,480 under two years, making together 1,461,061, or 4·8 per 100 acres under crops, &c. Dividing England into grazing counties and corn-growing counties, the 23,370,502 acres under crops of all kinds, bare fallow, and grass are distributed thus:—12,273,000 acres in grazing counties, or 52·5 per cent. of the whole number, and 11,098,000 acres, or 47·5 per cent. in corn counties. Rather more than half the horses—viz., 575,000, or 50·4 per cent.—are in the grazing counties, and 567,000, or 49·6 per cent., are in the corn counties. But 54·6 per cent. of the horses under two years are in the grazing counties, and only 45·4 per cent. in the corn counties. The occupiers of land in Suffolk make returns showing an average of 6 horses to every 100 acres under crops, &c.; the East Riding of Yorkshire, 6·1; Surrey also 6·1, and Middlesex 6·3; Glamorgan, 6·2, and Cornwall 6·4. Norfolk shows 5·8 horses per 100 acres; Essex and Worcester, 5·5; Cambridgeshire, 5·4; Lancashire and the West and North Ridings, 5·3; Monmouth and Hereford, 5·2; Devon and Nottingham, 5·1. On the other hand, Dorset shows only 3.9 per 100 acres; Wilts, 3·5; Westmoreland also 3·5; Northumberland only 3·1. In the other English counties the numbers are between 4 and 5 per 100 acres. In Scotland, Orkney shows 7, and Shetland 9·4 per acres under crops, &c.; Inverness, 7·3; Sutherland, 11·7; Dumfries, only 3·5; Renfrew, 3·4; Selkirk, 3·3; Lanark and Kirkcudbright, 3·2; Peebles and Berwick, 3·1. The number of horses in Ireland, in town and country, is returned as 527,248; in the Channel Islands and Isle of Man, 9,838 in the possession of occupiers of land; and, adding to these the returns from occupiers in Great Britain, the result is 1,998,147. The addition of the estimate for horses in towns brings the whole number of horses in the United Kingdom to about two and a half millions.

AGRICULTURE OF GREAT BRITAIN.—The subjoined table, compiled from the returns of the Board of Trade, gives the acreage under various crops, with number of live stock, found in Great Britain on the agricultural census of the 25th of June, 1869:—

CORN CROPS.	Acres.
Wheat	3,688,357
Barley or Bere	2,251,480
Oats	2,782,720
Rye	64,099
Beans	575,204
Peas	396,177
Total	9,758,037

Green Crops.	Acres.
Potatoes	585,211
Turnips and Swedes	2,171,526
Mangold	292,742
Carrots	14,344
Cabbage, Kohl-Rabi, and Rape	145,251
Vetches, Lucerne, and any other Crop (except Clover or Grass)	365,993
Total	3,575,067

Other Crops, Grass, &c.	
Flax	20,923
Hops	61,792
Bare Fallow or Uncropped Arable Land	738,836
Clover and Artificial and other Grasses under Rotation	3,448,726
Permanent Pasture, Meadow, or Grass not broken up in Rotation (exclusive of Heath or Mountain Land)	12,735,897

Live Stock.	Number.
Cattle	5,313,473
Sheep	29,538,141
Pigs	1,930,452

Agricultural Holdings in Ireland.—Returns laid before Parliament in the session of 1870 show 682,237 agricultural holdings in Ireland. No less than 526,539 are "tenancies at will," or, more strictly speaking, tenancies from year to year, terminable by notice to quit; 135,392 are holdings on lease; 20,217 are holdings in the occupation of proprietors in fee; in eighty-nine cases information of the nature of the tenure has been refused. The holdings on lease may be classed thus:—25,406 are held under lease for terms not exceeding 21 years; 22,217 under lease for terms exceeding 21, but not exceeding 31 years; 4,312 for terms exceeding 31, but not exceeding 60 years; 5,497 for terms exceeding 60, but not exceeding 99 years; 3903 for terms exceeding 99 years; 28,339 on leases for lives; 30,880 on leases for lives or years alternative; 4,540 on leases for lives renewable for ever; 10,298 in perpetuity. The number of agricultural holdings valued under 15*l.* is 512,080, and 428,935 of them are tenancies at will. There are 94,098 agricultural holdings valued at 15*l.* and under 30*l.*, and 63,154 of them are tenancies at will. There are 38,534 valued at 30*l.* and under 50*l.*, and 21,129 of them are tenancies at will. There are 24,857 valued at 50*l.* and under 100*l.*; 10,230 of these are tenancies at will. There are 12,668 valued at 100*l.* and upwards; 3,091 of them are tenancies at will. In Ulster there are 250,728 agricultural holdings, and 205,549 are tenancies at will. Of the 194,265 holdings valued under 15*l.* 167,742 are tenancies at will; and of the 36,774 valued at 15*l.* and under 30*l.* 26,789 are tenancies at will. In Munster there are 145,712 agricultural holdings, and 93,468 of them are tenancies at will; of the 95,961 holdings valued under 15*l.* 69,423 are tenancies at will, and of the 25,564 valued at 15*l.* and under 30*l.* 14,407 are tenancies at will. In Leinster there are 140,086 agricultural holdings, and 100,744 are tenancies at will; of the 91,401 holdings valued under 15*l.*, 74,287 are tenancies at will, and of the 23,043 valued at 15*l.* and under 30*l.*, 15,666 are tenancies at will. In Connaught there are 145,711 agricultural holdings, and 126,778 are tenancies at will; of the 130,453 holdings valued under 15*l.* no less than 117,483 are tenancies at will, and of the 8717 valued at 15*l.* and under 30*l.*, 6,292 are tenancies at will. In Leitrim 14,914 of the total 16,992 holdings under 15*l.* are tenancies at will; in Roscommon, 18,943 of the total 20,913; in Sligo, 13,507 of the 14,952; in Westmeath, 6548 of the 7453; in Longford, 5800 of the 6910; in Armagh, 22,755 of the 24,906; in Monaghan, 15,342 of the 16,967. The returns for the several unions show some remarkable results. In the union of Ballina the total number of holdings is 4402, and 4015 of them are tenancies at will. In Belmullet there are 3095 holdings, and 2737 of them are tenancies at will. In Cahirciveen the holdings are 2978, and 2772 of them are tenancies at will. In Castlerea 6914 of the whole 7667 are tenancies at will; in Clifden, 3433 of the whole, 3774; in Dingle, 2063 of the whole, 2262; in Dromore West, 2798 of the whole, 3123; in Kenmare, 1913 of the whole, 2112; in Oughterard, 2655 of the whole, 2991; in Roscommon, 3973 of the whole, 4244; in Tuam, 6265 of the whole, 6535; in Skull, county Cork, 1641 of the whole, 1815. But Cork can beat this in another of its unions, Castletown, which has in all 2634 agricultural holdings, and 2601 of them are tenancies at will.

Standard Weights and Measures.—The Warden of the Standards, Mr. H. W. Chisholm, states in his report for the year ending March 31, 1870, that there were at that date 114 places in the United Kingdom, counties or boroughs, without legal standard weights, and 85 without legal standard measures. No copies of the standard weights are legal unless reverified every five years, or of the standard measures unless reverified every ten years. There may be other places in the same predicament which have not yet come under official notice; for a set of standard weights and measures of the borough of Lostwithiel was, not long since, delivered at the Standard-office for reverification, bearing the date of 1741 and the Exchequer stamp of verification of the reign of George II., and it is stated that these standards have been in use up to the present time in the borough. The books of the department, beginning with 1824, contain no record of the verification of any standards for Lostwithiel. These standards appeared in good condition, considering their age. The weights were deficient—the lb. weight (avoirdupois) was 6·5 grains deficient, the error tolerated being only 0·25 grain. Most of the measures of capacity were in excess; the half-bushel was one and a quarter gill in excess. The report gives an account of the year's work in the reverification of standard weights and measures. A set of standard avoirdupois weights is being con-

structed of glass with a view of ascertaining how far, with reference to the cost, durability, and invariability of such weights, the surface not being liable to oxidation, it may be desirable that glass should be used as the material for local standard weights. New standard measures of one-sixth and one-twelfth of a gallon, as measure of the wine-bottle and half wine-bottle have been constructed. The Coinage Act of 1870 (33 & 34 Vict. cap. 10) imposed new duties on the Standards Department; and new standard weights of the gold, silver, and bronze coins, 16 in number (ranging from the 5*l.* and the 2*l.* gold piece down to the farthing, and including silver twopences and pennies) are now being constructed under the provisions of the Act. As soon as these standard coin weights shall have been duly verified and made legal standards by an Order in Council, regulations will be issued under which any copies of the standard coin weights may be verified and marked or stamped in the department; and no weights, other than those so marked or stamped, are to be deemed just weights for determining the weight of gold and silver coins of the realm.

5.—Population.

Births and Deaths.—In the year 1869 there were registered in the United Kingdom 1,032,177 births and 660,966 deaths, thus making the natural increase 371,211, or, after correction, 1,056 daily. The estimated population in the United Kingdom in the middle of the year 1869 was 30,621,431. The birth-rate per 1000 of the year was 35·34; the death-rate 22·74. The birth-rate per 1000 of England in 1869 was 35·34, the death-rate 22·64; the mean of the preceding ten years in England was the same for the birth-rate, and 22·48 for the death-rate. According to the quarterly return of the Registrar-General, 275,273 births and 162,750 deaths were registered in the United Kingdom, in the three months ending June 30, 1870. The natural increase of population was thus 112,523. The resident population in the middle of 1870 is estimated at 30,838,210; that of England and Wales amounting to 22,090,163; of Scotland to 3,222,837; and of Ireland to 5,525,210. The corrected death-rate of the quarter ended June 30, 1870, was 22·1 per 1000, and the birth-rate, 37·1.

Marriages. — The Registrar-General states the number of marriages in England and Wales in 1869 to be 176,629 or 333 fewer than in 1868. We must go back to 1863 to find so few marriages in England as in 1869. In 1864, 1865, and 1866 the number was constantly increasing, and in neither of these three years was it so low as 180,000. In 1867 the number fell to little over 179,000, being 8600 less than in 1866; in 1868 it was lower still by above 2000; and in 1869 completed a series of three bad years following three good years. But in the two last quarters of 1869 marriages increased, and were more than in the corresponding quarters of 1868.

Rates of Mortality.—The rate of mortality varies much in different divisions of England. In 1869 it ranged thus:—In the south-eastern division, which is almost always lowest, the death-rate was only 19·68 per 1000; in the south-western, which, as usual, was second, 19·90 per 1000. The three next divisions in rank of salubrity seldom differ very much from each other in the returns; the south midland was 20·18 per 1000 in 1869, the eastern 20·40, the Welsh 20·43. The west midland and north midland hold the next place, the former showing a mortality of 21·12 per 1000, the latter 22·04; the west midland also in 1868 presented the better return of the two, though it is the more densely populated. At this point in the table there is again a marked increase in mortality. The northern division comes next, with a death-rate of 23·21 per 1000, and then the metropolis with 24·66. The north-western division shows a ratio of 25·16 per 1000. and Yorkshire closes the list with 25·80 per 1000. It is new to find Yorkshire the hindmost; it has often stood before London in the list, and should be uneasy in its present place.

Mortality in Large Towns.—The Registrar-General's returns for the year 1869 show the rate of mortality in that year in 60 great towns and boroughs of the United Kingdom—the mean of the four quarterly rates, which is sufficiently accurate for all ordinary purposes. The towns are placed in two classes. The 14 chief cities and towns have an aggregate population of more than 6,500,000, and ranking them in order, from least mortality to greatest, they stand as follows:—In Birmingham, the mortality in 1869 was at the rate of 21·51 per 1000 of the estimated population; in Dublin, 24·01; in Bristol, 24·22; in London, 24·66; in Hull, 25·37; in Bradford, 25·53; in Newcastle-upon-Tyne, 26·10; in Leeds, 26·25; in Salford, 26·75; in Sheffield, 27·58; in Manchester, 28·97: in Liverpool, 29·06; in Edinburgh, 30·34; in Glasgow, 34·31. The 46 towns and boroughs next in importance have an aggregate population of more than 2,800,000; the returns generally relate to the districts or sub-districts, which approximately represent the municipal boroughs, but in a few instances the letter P is added, to denote that the area is that of a Parliamentary borough. Foremost stands Gosport, or rather the parish of Alverstoke, which includes Gosport; the mortality in 1869 was only 17·49 per 1000 of the estimated population. Birkenhead, P, including some neighbouring townships, comes next, with a death-rate of 18·99 per 1000; but Walsall (with Bloxwich, &c.), is close upon it, having barely a ratio of 19 per 1000; and also Coventry, with 19·01 per 1000. Chester shows a ratio of 19·41, and Merthyr Tydfil, P (with its neighbourhood), 19·46 per 1000; Brighton, the parish, has a death-rate of 20·18; Dudley, P, 20·24; Nor-

wich, 20·40; Portsmouth, 20·51; Southampton, 20·52 per 1000. Devonport.—Stoke Damerel, 20·37, and East Stonehouse, 26·07 per 1000. Plymouth shows for 1869 a mortality of 21·06; Oldham, 21·65; Bath, 21·76; Stockport, 21·98 per 1000. Sunderland shows a ratio of 22 per 1000; Chatham, P, with Rochester and Gillingham, 22·2; Cheltenham, P, 22·23; Yarmouth, 22·58; Ipswich, 22·68; Cardiff, with Llandaff, Roath, &c., 22·81; Wolverhampton, 22·89 per 1000. Northampton presents a death-rate of 23·04; Preston, 23·12; Swansea, with Morriston, &c., 23·23; Ashton-under-Lyne, 23·39; Nottingham, 23·44; Huddersfield, P, the township, 23·49; Stoke-upon-Trent, P, including Hanley, Burslem, Tunstall, Longton, &c., 23·52; York, 23·54; Tynemouth, with North Shields, 23·69 per 1000. Rochdale shows a death-rate in 1869 of 24·18 per 1000; Bury, P, 24·25; Wigan, the township, 24·34; Leicester, 24·69; Macclesfield, 24·78; Worcester, 24·79; Derby, 24·95: Halifax, the township, together with Skircoat township, shows a mortality of 26·39 per 1000. South Shields, with Westoe, 26·82; Blackburn, the township, 28·09; Exeter city, 28·22; Bolton, 28·60; Gateshead, 28 81 per 1000. A large proportion of the highest death-rates, it will be observed, are in the North. A correction has been made in several instances on account of the workhouse being in another district, or, on the other hand, on account of the presence of the workhouse of a larger area, or of a county hospital or lunatic asylum.

Vital Statistics of Scotland.—The Registrar-General of Scotland reports that in the year 1869 there were registered in that country 113,395 births, 75,789 deaths, and 22,083 marriages. The population in the middle of the year 1869 was estimated at 3,205,481. The returns show a birth-rate in the year amounting to 3·54 per cent. on the population; a death-rate of 2·36 per cent., marriages 0·68 per cent. This birth-rate coincides with the average of the ten preceding years; the marriage-rate is 0·02 below the average; the death-rate is 0·17 above the average. The mortality was above the average in every quarter of the year; most above the average in the last quarter. In that quarter the rate of mortality in 1869—viz., 2·42 per cent.—was higher than in the corresponding quarter of any one of the ten preceding years.

Irish Registrar-General's Return.—The Registrar-General for Ireland reports that 145,912 births were registered in Ireland in 1869, being only 2·64 per cent. of the estimated population; and 90,039 deaths, being only 1·63 per cent. The returns show 66,568 emigrants leaving the ports of Ireland in 1869, the average of the previous five years being 91,355; so that the result would appear to be a decrease of 10,695 in the population. But the registration of births and deaths is defective, and these numbers cannot be accepted; it is therefore assumed that the births and deaths were at the same ratio to population as in England—that the births were about 196,000 and the deaths above 125,000. On this estimate the natural increase was rather greater than the emigration, and the population of Ireland increased a little in 1869.

The Great Metropolis.—According to the Registrar-General's returns for 1869, the area of London was 77,997 acres, or 122 square miles; this is equal to 31,563 hectares, or 316 square kilometres; the houses, 406,507, each inhabited by 7·8 persons; the annual value of property (county rate assessment of 1866), 15,261,999*l.*; and the density 100 persons to a hectare, 41 persons to an acre, 25,990 to a square mile. The population of London resides at a mean elevation of 11·9 metres (39 ft.) above Trinity high-water mark, the elevation varying from 3·4 metres (11ft.) below high-water mark in Plumstead marshes to 131 metres (429 ft.) above high-water mark in Hampstead. In 1869 the births were—males, 56,876; females, 55,054—total, 111,930; the deaths—males, 39,812; females, 38,121—total, 77,933. The population (estimated for the middle of the year) was—males, 1,478,840; females, 1,691,914; total, 3,170,754; the annual rate of mortality per 1000—males, 27·01; females, 22·61; total, 24·66; annual rate of increase of population per cent., 1851-61, 1.73. The Registrar-General in his report, dated Somerset House, Feb. 19, 1870, makes the following remarks respecting the growth of London:—"Until the next census the populations of the great English cities can only be conjectured. They necessarily vary from year to year, as their increase depends upon the births and deaths and upon the strength of the two opposite currents of migration inwards and outwards. Yet the growth of London, as well as of many of its sister cities, has latterly from decade to decade been constant, and has fluctuated within narrow limits of variation; so the estimated number of 3,170,754 souls for the year 1869 probably differs little from the true figure of the population living on the hills, acclivities, and banks on both sides of the Thames. This population is within the domain of the Metropolitan Board of Works. Outside this area of 122 square miles is a broad circle, every year spreading, and occupied in the year 1869 within the Metropolitan Police district by full 524,535 souls. The drainage of these outlying parts is excluded from the Metropolitan scheme. The water companies and the gas companies often supply both regions. The excess of births over deaths in the 52 weeks of 1869 was 33,997, and if the calculated growth of London is correct, the immigrants must exceed annually the emigrants by some 10,000."

London Bills of Mortality.—The annual rates of mortality in the metropolis show a mean of 24·35 per 1000 of population for the 30 years 1840-69. For the north districts, 22·84; for the west, 22·87; for the south, 24.71; for the central, 25·05; for the east, 26·09. The approximate result is that

in the north and the west districts the annual deaths averaged 1 in 44 persons living; in the central and south districts, 1 in only 40 persons living; in the east, 1 in only 38 persons. The rate of mortality in London in 1860 was 24·66 per 1000 of population, a death-rate which has only been three times exceeded in the last 20 years—viz., in 1864 and in the two cholera years, 1854 and 1866. The death-rate in 1869 was 22·63 per 1000 in the west districts, 23·71 in the north, 23·82 in the south, 25·69 in the central, 28·17 in the east districts. The deaths in the metropolis from scarlet fever in the eight years 1861–68 averaged 2,814 a year; in 1869 they were no less than 5803—viz., 648 in the first quarter, 675 in the second, 1770 in the third, 2710 in the fourth quarter of the year. The mortality from scarlet fever in the metropolis in 1869 amounted to 183 deaths to every 100,000 persons living; but in the following districts it exceeded 300 in 100,000 living:—St. George-in-the-East, 314; Poplar, 326; Bethnal Green, 365; Rotherhithe, 367; Bermondsey, 386. The number of deaths from scarlet fever in London in 1869 was greater than from any other disease except two,—namely, phthisis, which carried off 8788, and bronchitis, 8059 souls. The cause of death in 1869 was specified in 77,406 cases; 20,885 deaths were from zymotic diseases, 14,442 from constitutional diseases, 31,334 from local diseases, 8397 from developmental diseases, and 2348 were violent deaths. Of this last number 1914 deaths were by accident or negligence; 774 of them by fractures and contusions, 263 by burns and scalds, 44 by poison, 297 by drowning, 388 by suffocation; 110 deaths by homicide (murder or manslaughter) were registered; 302 by suicide, the largest number probably ever recorded in London in any one year.

6.—Crime and Pauperism.

Commitments and Convictions.—In the year 1869 there were 19,318 persons, namely, 15,722 men and 3596 women, committed for trial in England and Wales, and of this number there were 14,340 convicted, and 1382 acquitted. In Scotland there were 3510 persons, namely, 2752 men and 758 women, committed for trial in 1869, and of the number the convictions amounted to 2592, and of acquittals to 918. Lastly, in Ireland the total number of persons committed for trial in 1869 was 4151, made up of 3340 men and 811 women, and of this total there were 2452 convicted and 1699 acquittals. It will be seen that the proportion of acquittals in Ireland was much larger than in Scotland, and the proportion of both Ireland and Scotland together far above that of England and Wales. It may be further noticed that the proportion of women to men committed for trial varies greatly in the three divisions of the United Kingdom.

Convict Prisons.—The grants voted by the House of Commons in the session of 1870 made provision for 10,150 prisoners in convict prisons in England, and 1630 in Ireland, showing respectively an increase over the previous year of 1490 and 100. The numbers for which provision was made in the vote for the financial year 1870-71, amounted to 566 at Brixton, 1600 at Chatham, 1030 at Dartmoor, 330 at Fulham, 1185 at Millbank, 450 at Parkhurst, 798 at Pentonville, 1540 at Portland, 1250 at Portsmouth, and 701 males and 700 females at Woking. In Ireland the numbers were 800 at Spike Island, 115 at Lusk, and 225 males and 490 females at Mountjoy.

Juvenile Criminals.—The visiting inspector of reformatory and industrial schools in Great Britain, Mr. Sydney Turner, is able to state in his report, issued in 1870, that the increase of offenders, committed to prison in the preceding three years has been much more in adults than among persons under sixteen years of age. He gives the numbers sent to prison in England and Wales, whether on summary convictions or on conviction, or committal for more serious offences, including committals on remand and resulting in discharge—in fact, the prison return of persons received. The adults were 114,935 in 1866 (the year ending at Michaelmas), but 146,940 in 1869, and the persons under 16 were 9356 in 1866, and 10,314 in 1869. The ratio of increase in adults committed is double that of young persons committed. Whatever the cause of this difference may be, the fact is that, since 1854, when the Reformatory Schools Act was passed, more than 20,000 young offenders have been admitted into these schools, above 16,000 boys and above 4000 girls; and the whole number of children committed to industrial schools (also up to the end of 1869) has been nearly 12,000, namely 9000 boys and 3000 girls. Industrial schools are now, in fact, but reformatories of a milder sort, houses of detention for the young vagabond and petty misdemeanant. Notwithstanding their name of "school," they are of a corrective and not merely educational character. At the close of the year 1869, there were in reformatory schools in England 3534 boys and 860 girls, and 562 boys and 63 girls were out on licence to employment preliminary to being discharged; and in industrial schools there were 3285 boys under detention, and 1008 girls, besides 68 boys and 33 girls out on licence. The returns relating to those who were discharged in the three years 1866-68, all of whom, therefore, had had at least a year's probation since their discharge, show that in the common average reformatory school seven in ten of those committed can be made trustworthy and self-supporting members of society; while in many, either better managed or more favourably circumstanced, this proportion rises to between eight and nine in ten. Many also who relapse, and are re-

turned as "convicted," afterwards regain and maintain an honest character.

PAUPERISM IN ENGLAND AND WALES.—The annual return of the Poor Law Board for New Year's-day shows that on the 1st of January, 1870, there were 169,471 persons receiving in-door relief from the poor-rates in England and Wales, and 915,727 out-door relief, making together 1,085,198; or, deducting a few persons receiving both in-door and out-door relief on that day, 1,084,821. The increase over the number on the 1st of January, 1869, is stated to be 36,963, or 3·5 per cent. The number of adult able-bodied paupers, 193,862 shows an increase of 10,700, or 5·8 per cent. The number relieved on the 1st of January, 1870, is classified thus:—Men, 58,076 in-door and 176,693 out-door; women, 50,179 in-door and 402,055 out-door; children under 16, 56,869 in-door and 335,257 out-door; vagrants, 4147 in-door and 1283 out-door; unclassified medical relief cases, 439. Or thus:—Able-bodied, 51,169 in-door and 445,446 out-door; not able-bodied, 102,783 in-door and 433,587 out-door; insane, 11,375 in-door and 34,971 out-door; vagrants, 5430, as above; and medical cases, unclassified, 439. Or again thus:—Able-bodied, 57,234 men, 136,855 women, and 302,526 children relieved with able-bodied parents; not able-bodied, 157,422 men, 290,244 women, and 88,674 children relieved with parents not able-bodied, or relieved without their parents; insane, 20,088 men, 25,315 women, and 926 children; 5430 vagrants, and 439 not classified. The increase over the 1st of January, 1869, is chiefly in out-door relief. The increase in paupers of all classes is 6·2 per cent. in the metropolis; 7·3 per cent. in the south-eastern division; 2·5 in the south midland; 0·5 in the eastern; 1·5 in the south-western; 1·2 in the west midland; 1 in the north midland; 7·7 in the north-western—viz., Lancashire and Cheshire; 5·8 in Yorkshire; 2 in the northern division; and the Welsh shows a decrease of 0·8 per cent. The increase in the number of adult able-bodied paupers, men and women (exclusive of vagrants), is 10 per cent. in the metropolis, 10·7 in the south-eastern division, 5·1 in the south midland, 0·1 in the eastern, 2·7 in the south-western, 0·9 in the west midland, 1·5 in the north midland, 12·4 in the north-western, 6·8 in Yorkshire, 1·4 in the northern division; and Wales shows a decrease of 1 per cent. The increase of pauperism in the year was chiefly in London and its neighbourhood and some counties south of it, Lancashire, the West Riding of Yorkshire, and Durham. South Wales shows an increase, but North Wales a larger decrease. It is stated in the twenty-second annual report of the Poor Law Board, issued in July, 1870, that in the parochial year ending at Lady-day, 1869, the expenditure for the relief of the poor in England and Wales amounted to 7,673,100*l.*, being an increase of 2·3 per cent. over the preceding year. The rate per head on the population increased from 6*s.* 11½*d.* to 7*s.* 0¾*d.*; this last rate was only once, viz., in 1848, equalled in the preceding thirty-three years. The rate in the pound on the annual value of rateable property (as returned in 1868) was a fraction over 1*s.* 6¼*d.* The mean number of paupers in receipt of relief in 1868-69 shows an increase of 2·6 per cent. over 1867-68. The Board call attention to the fact that although the number of paupers and the expenditure have again increased, the ratio of increase has been checked. They also observe that the expenditure has increased in recent years in a much larger ratio than the number of paupers. The same number of paupers costs very much more now than twenty years ago. The Board remark that in establishments generally, both public and private, the scale of salaries has long been increasing, and more people are required to do the same work. But apart from this general cause, the more humane views which have prevailed in the last few years as to the treatment of the sick poor have added most materially to Poor Law expenditure. An increase in the number of persons receiving relief may not always indicate increased destitution; the number may be swelled by poor persons who, in previous years, though really poor, refrained from coming on the rates, but whom changes in the law, or the mode of its administration, have since attracted. Taking the ten years 1850—1859 and 1860—1869, the average pauperism in the former period was 900,000, and in the latter 950,000,—an increase of 5½ per cent. The average annual expenditure in the former period was 5,500,000*l.*; if the scale of cost had remained unchanged, the annual average in the second period would have been 5,800,000*l.*, but it was, in fact, 6,500,000*l.*, so that the cost increased by about 12 per cent. more than the number of paupers. The average price of wheat in the first decade was 53*s.* 3*d.*, and in the second, 51*s.* 6*d.* A comparison of the earlier years of the first decade with the later years of the second shows that partly in consequence of dearer bread, but mainly from still more influential causes, the ratepayers have had to pay 40 per cent. more for the maintenance of the same number of poor in the last few years than they had to pay 20 years ago.

COST OF PAUPERISM IN ENGLAND, SCOTLAND, AND IRELAND.—The subjoined table exhibits, after the returns of the "Statistical Abstract for the United Kingdom," the total amounts received from poor-rates, and the total amounts expended in actual relief of the poor in England, in Scotland, and in Ireland, during each of the five years 1865 to 1869.

ENGLAND AND WALES.

Years ended Lady-day.	Total Amount of Poor Rates Received.	Expended in actual Relief of the Poor.
	£	£
1865	9,769,142	6,264,966
1866	9,958,250	6,439,517
1867	10,692,188	6,959,840
1868	11,472,843	7,498,059
1869	11,776,153	7,673,100

Scotland.			Ireland.		
Years ended 14th May.	Total Amount of Poor Rates received.	Expended in actual Relief of the Poor.	Years ended Lady-day.	Total Amount of Poor Rates received.	Expended in actual Relief of the Poor.
	£	£		£	£
1865	789,928	778,274	1865	752,513	736,629
1866	796,574	783,127	1866	759,174	726,340
1867	830,279	807,631	1867	756,046	797,134
1868	842,893	863,202	1868	848,971	841,512
1869	892,712	931,275	1869	927,046	836,553

Poor Law Machinery.—The number of paid officers locally employed in the administration of the Poor Laws in England and Wales in 1869, exclusive of the metropolitan district, was no less than 13,849. 618 were clerks to the guardians, 3,906 medical officers, 1,336 relieving officers, 629 masters of workhouses or superintendents of schools, 636 matrons of workhouses or schools, 307 schoolmasters, 489 schoolmistresses, 1,521 collectors of rates, 227 assistant overseers, 460 porters, 98 male nurses, 689 nurses, 2,933 assistant relieving officers, industrial trainers, and other officers and assistants.

7.—Education.

Progress of Education in Great Britain. — The following table, compiled from the last official returns, exhibits the progress of education in Great Britain, distinguishing England and Wales, and Scotland, in the fifteen years from 1855 to 1869:—

	England and Wales.			Scotland.	
Years ended 31st August.	Number of primary Schools inspected.	Number of Children present at Inspection.	Years ended 31st August.	Number of primary Schools inspected.	Number of Children present at Inspection.
1855	3,853	483,934	1855	974	85,142
1856	4,237	552,226	1856	942	93,679
1857	4,438	602,557	1857	960	98,315
1858	5,435	698,303	1858	1,206	123,441
1859	5,531	757,082	1859	1,055	123,049
1860	6,012	830,971	1860	1,260	131,961
1861	6,259	879,884	1861	1,446	148,806
1862	6,113	906,158	1862	1,456	151,268
1863	6,227	932,603	1863	1,512	160,138
1864	6,470	983,928	1864	1,421	149,363
1865	6,865	1,081,480	1865	1,573	164,575
1866	7,134	1,116,374	1866	1,619	171,230
1867	7,601	1,210,301	1867	1,739	180,799
1868	8,051	1,332,533	1868	1,843	195,132
1869	8,592	1,448,299	1869	1,745	191,203

Total for Great Britain.

Years ended 31st August.	Number of primary Schools inspected.	Number of Children present at Inspection.	Years ended 31st August.	Number of primary Schools inspected.	Number of Children present at Inspection.
1855	4,800	569,076	1863	7,739	1,092,741
1856	5,179	645,905	1864	7,891	1,133,291
1857	3,398	700,872	1865	8,438	1,246,055
1858	6,641	821,744	1866	8,753	1,287,604
1859	6,586	880,131	1167	9,340	1,191,103
1860	7,272	962,932	1868	9,894	1,527,665
1861	7,705	1,028,690	1869	10,337	1,639,502
1862	7,569	1,057,426			

PARLIAMENTARY GRANTS FOR EDUCATION.—The subjoined tabular statement shows the grants voted by Parliament for primary schools in Great Britain in each of the years ending the 31st of December, 1855 and 1869. It will be seen that in the interval of the fifteen years the total amount of the annual grant more than doubled.

Branches of Expenditure from Grants.	1855	1869
	£	£
In building, enlarging, repairing, and furnishing elementary schools	71,288	34,828
Do. do. Normal or training colleges	6,155	—
In providing books, maps and diagrams, and scientific apparatus	2,884	—
In augmenting salaries of certificated schoolmasters and schoolmistresses	44,878	34,629
In paying salaries of assistant and probationary teachers . .	4,556	3,667
In paying stipends of pupil teachers, and gratuities for their special instruction .	143,807	43,508
In capitation grants .	10,126	—
In annual grants to training colleges . .	39,960	72,512
In grants to reformatory, night, and industrial schools . . .	1,678	635
In inspection . . .	30,241	60,889
In administration (office in London) . . .	12,164	22,672
In miscellaneous . .	1,865	4,588
In grants under the Revised Code for examination and attendance of scholars . . .	. .	542,899
Total . . .	369,602	820,827

ELEMENTARY EDUCATION IN GREAT BRITAIN.—The vote passed by Parliament in aid of public education for the financial year 1870–71 was founded, so far as regards England and Wales, on an estimate that there will be grants averaging 9*s.* 10*d.* for 1,196,257 day scholars in elementary schools, and 6*s.* 8*d.* for 79,857 evening scholars. The rate of grant actually paid per day scholar has risen from 8*s.* 1*d.* in 1863 to 9*s.* 7*d.* in 1869; and per evening scholar from 5*s.* 9½*d.* in 1865 to 6*s.* 6¾*d.* in 1869. The vote proposed for public education in Great Britain in the year 1870–71 was 914,721*l.*, being an increase of 74,010*l.* over the vote for 1869–70. The expenditure from the public grant in the year 1868–69 in Great Britain was 773,839*l.*—namely, 443,535*l.* upon schools connected with the Church of England 81,737*l.* upon schools connected with the British and Foreign School Society, 36,194*l.* on Wesleyan schools, 33,929*l.* on Roman Catholic schools in England and Wales, 120*l.* on parochial Union schools, 92,647*l.* on schools in Scotland, and 85,677*l.* in the administration of the grant, including inspection. The statements which follow relate to England and Wales only. The census of 1861 showed 1,028,040 children between three and five years of age; 2,344,066 between five and ten; 2,105,176 between ten and fifteen; making a total of 5,477,282, since increased probably about 10 per cent. In the year ending the 31st of August, 1869, there were on the books of schools aided with annual grants 252,277 children under five years of age; 893,827 between five and ten; 423,035 between ten and fifteen; making in all, 1,569,139. The average number attending school was 1,062,299. The number of children over six years of age whose attendances qualified them for presentation for examination was 843,142. The number present on the day of inspection was 1,328,863. The number presented for examination was 696,440—viz., 430,131 six years old but under ten, and 266,309 over ten years old. 67·54 per cent. passed without failure in any one of the three subjects. Of the whole 696,440 presented, 30·95 per cent. were presented for examination under Standard I., the lowest test of acquirements; 25·17 per cent. under Standard II.; 18·95 per cent. under Standard III.; leaving only one-fourth for the three higher standards. 13 per cent. were presented under Standard IV.; 7·64 per cent. under Standard V.; and 4·29 per cent. under Standard VI. 63·41 per cent. of the scholars on the registers were between six and twelve years old; 11·21 per cent. were between six and seven; 11·66 per cent. between seven and eight; 11·8 per cent. between eight and nine; 11·29 per cent. between nine and ten; 9·73 per cent. between ten and eleven; 7·72 per cent. between eleven and twelve. Standard IV. is meant to be passed by children between nine and ten; 90,548 children were presented under it, 67,089 of whom, or nearly three-fourths, were above ten years old; 49,897 passed without failure in either of the three subjects, 37,080 of whom were over ten. Standard V. is meant for children between ten and eleven; 53,217 were presented under it, of whom 50,679 were over ten; 32,089 passed without failure, 30,473 of them above ten years old. Under Standard VI., for children over eleven, 29,897 were presented; 17,861 passed without failure. Of the day scholars presented for examination in 1869 under Standard IV., only 66·81 per cent. passed in arithmetic; of those presented under Standard V., only 70·72 per cent.; of those presented under Standard VI., only 68·29 per cent. The returns show that at the close of the year 1869 there were serving in aided schools in England and Wales 12,027 certificated teachers, 1236 assistant teachers, and 12,842 pupil-teachers, making a total of 26,105. The number of students resident in training colleges in 1869 was 2286; this number is equal

to the supply of 1143 fully-trained teachers per annum, or rather less, if the few who reside for one year only be excluded.

National Education in Ireland.—The Commissioners of National Education in Ireland report that in the year 1869 the number of national schools in operation increased to 6,707. The number of children on the rolls within the year was 991,335, an increase of 23,772 over 1868; and the average daily attendance of children for the year was 358,560, an increase of 3707. Of the pupils on the rolls 80·98 per cent. were Roman Catholics, 10·98 per cent. Presbyterians, 7·36 per cent. belonged to the Established Church, and 0·68 per cent. to other denominations; 58·6 per cent. of the schools had a mixed attendance of Protestant and Roman Catholic pupils. 121,376 Protestant pupils were mixed with 29,768 Roman Catholic in 1133 schools taught exclusively by Protestant teachers; 25,078 Protestant pupils were mixed with 361,879 Roman Catholic in 2610 schools taught exclusively by Roman Catholic teachers; and 14,252 Protestant pupils were mixed with 12,970 Roman Catholic in 120 schools taught conjointly by Protestant and Roman Catholic teachers. The unmixed schools, 41·4 per cent. of the whole number, show a greater increase in 1869 than the mixed schools. The mixed schools from which returns have been received had 565,323 pupils on the rolls, viz., 160,706 Protestants and 404,617 Roman Catholics. The unmixed schools had 425,963 pupils; 27,795 were Protestant pupils in schools under Protestant teachers, and 398,168 were Roman Catholic pupils in schools under Roman Catholic teachers. In various parts of the kingdom the education of the minority can only be provided for in mixed schools with the protection of a rule to prevent tampering with the faith of the children, the numbers being so few that a separate school could not be kept up for them; but under that protection parents are able to select the most convenient school, or that which has the best master. The returns relating to literary proficiency of 732,102 pupils show 41·4 per cent. of them in the first book; 34·3 per cent. in the second; 17 per cent. in the third; 7·3 per cent. in the fourth and higher books. The examination by the inspectors showed 71·8 per cent. of 314,192 pupils examined in reading to be equal to the requirements of the school programme, and 58·9 per cent. of 176,792 examined in writing; of 203,127 examined in arithmetic 36·8 per cent. of those examined in rotation were found equal to the programme, 53·7 per cent. of those examined in subtraction, 24·1 per cent. in division of money, and 12·2 per cent. in proportion or practice. So also were 35·8 per cent. of 185,406 examined in grammar proved equal to the requirements; 48·2 per cent. of 205,898 examined in geography; 48·7 per cent. of the girls examined in sewing; 31·8 per cent. in knitting: 7·4 per cent. in cutting out. Vocal music is taught in 697 schools; drawing in 274. In 1803 schools the inspectors found the advanced pupils instructed in one or more extra branches,—viz., geometry, mensuration, algebra, or book-keeping; 73,148 pupils, or 22·78 per cent. of the entire number, were under seven years of age; 113,985, or 35·52 per cent., were seven years of age but under 10 years; 95,626, or 29·78 per cent., were 10 but under 13 years; and 38,317, or 11·92 per cent., were 13 years of age and above. The model schools had on their rolls in 1869, 17,507 pupils, and the average daily attendance was 8136. There were 135 school farms in connection with the schools. The Board trained in the year 299 teachers, of whom 149 were Roman Catholics; 881 new teachers entered the service of the Board in 1869; owing to the operation of the monitorial system in ordinary schools, and the pupil teacherships in model schools, more than half the new teachers had received some preparation of a technical character for their office. At the end of the year the Board had in their service 6305 principal teachers, 2311 assistants, 373 junior literary and industrial assistants, making together 8989, of whom 3440 are trained. The number of paid monitors was 3944. There were also 386 workmistresses and teachers of the higher industrial branches. The total amount received by the teaching staff of the schools in connection with the Board for the year 1869 appears to have been 328,009*l.* 18*s.* 2*d.*—only 18·0 per cent. of it locally provided, while the large proportion of 82·0 per cent. was derived from the funds provided by the State. The Board received, in all, nearly 400,000*l.* from the public purse.

Report on Primary Education in Ireland.—Prominent among the Blue-books of the Parliamentary Session of 1870 figured the first part of a huge report of the Royal Commissioners, who were appointed in January, 1868, to inquire into elementary or primary education in Ireland, and to advise measures which can be adopted for its more general extension among the people. Eight large folio volumes will communicate to Parliament and the public the results of this inquiry. The first volume, of 600 pages, contains the report of the Commissioners; the second volume, the reports of the Assistant Commissioners; the third, fourth, and fifth volumes are required for the evidence taken, and an analysis of the answers to upwards of 27,000 questions. The sixth volume will present the educational census of elementary schools, taken for the Commission; the seventh volume will give the returns obtained from the National Board; and the eighth will be devoted to returns received from other educational bodies, and some miscellaneous information obtained. The report of the Commissioners is divided into ten parts. The first contains an historical sketch of the system of national education in Ireland, and the second describes the provision at present existing for the primary education of the poor. The Commissioners state that the educational census of primary schools taken by the police on the 25th of June, 1868, shows that not more than 45 per cent. of the children of school age (five to fifteen) were at primary schools on that day.

8.—Social Economy.

Enclosures.—A Parliamentary return issued in July, 1870, shows that from the passing of the Enclosure Act of 1845 till the end of 1869 there have been 856 enclosures in England and Wales. The total extent was 540,358 acres; 370,848 acres were subject to public allotments for recreation grounds or cottage gardens. The area actually allotted amounts in the whole to 1633 acres for exercise and recreation grounds, and 2113 acres for the labouring poor.

Savings-banks Interest.—A Parliamentary return shows that in the fifty-two years from 1817 to the end of 1869, the dividends received by the National Debt Commissioners on account of the investments made for savings-banks amounted to 39,567,129*l.*; but the interest paid or credited to the trustees of the savings-banks in that period amounted to 43,736,557*l.*; so that there was a loss to the public purse of 4,169,428*l.* In the year 1869 alone the excess of interest paid or credited to the trustees was no less than 217,254*l.*

Post-office Savings Banks.—The Post-office Savings-banks continue to prosper, and the business done increases rapidly. There was not a post-office bank in the United Kingdom until the 16th of September, 1861, and at the end of the year 1869 there was 13,524,209*l.* due to depositors. The interest paid to depositors, or added to the credit side of their accounts, now exceeds 300,000*l.* a year. The amount paid in and the amount drawn out in the course of a year are very large; in the year 1869 5,787,218*l.* was received from depositors, and 4,227,656*l.* was paid to depositors. The charges of management and expenses incurred in the year 1869 amounted to 62,060*l.*

Deposits in Savings-banks.—At the close of the savings-banks year, on the 20th of November, 1869, the sums due to depositors in savings-banks in Bedfordshire amounted to 119,128*l.*; in Berkshire, 437,613*l.*; in Buckinghamshire, 147,958*l.*; in Cambridgeshire, 278,801*l.*; in Cheshire, 956,286*l.*; in Cornwall, 670,035*l.*; in Cumberland, 368,120*l.*; in Derbyshire, 605,368*l.*; in Devonshire, 1,728,855*l.*; in Dorsetshire, 409,110*l.*; in Durham, 281,946*l.*; in Essex, 385,930*l.*; in Gloucestershire, 948,367*l.*; in Hampshire, 338,119*l.*; in Herefordshire, 322,315*l.*; in Hertfordshire, 93,387*l.*; in Kent, 657,916*l.*; in Lancashire, 4,065,592*l.*; in Leicestershire, 325,228*l.*; in Lincolnshire, 809,243*l.*; in Middlesex, 5,057,162*l.*; in Monmouthshire, 124,142*l.*; in Norfolk, 659,919*l.*; in Northamptonshire, 321,505*l.*; in Northumberland, 961,936*l.*; in Nottinghamshire, 632,080*l.*; in Oxfordshire, 355,958*l.*; in Shropshire, 759,076*l.*; in Somersetshire, 892,578*l.*; in Staffordshire, 414,431*l.*; in Suffolk, 528,096*l.*; in Surrey, 621,227*l.*; in Sussex, 607,834*l.*; in Warwickshire, 368,407*l.*; in Westmoreland, 34,447*l.*; in Wiltshire, 505,496*l.*; in Worcestershire, 355,724*l.*; in Yorkshire, East Riding, 845,885*l.*; North Riding, 438,259*l.*; West Riding, 2,140,985*l.* The total for England was 30,574,473*l.*; for the United Kingdom, 37,554,557*l.*

Rateable Property.—By a poor law return issued in July, 1870, it appears that the rateable value of property in England and Wales for the year ending Lady-day, 1869, amounted to 81,945,719*l.*, being an increase of 2,311,274*l.* upon the rateable value for 1868. The gross estimated rental was 95,974,629*l.* Out of the 603 Unions into which England and Wales were divided, the valuations under the Assessment Act have been completely revised in 593 cases. Middlesex, more perhaps from the growth of property than from the circumstances of the assessment, heads the counties with an increase in its rateable value last year of 459,554*l.*, its contributions being 5,306,064*l.*; Lancashire comes next, with an increase of 357,736*l.*, its amount being 7,935,295*l.*; the West Riding of Yorkshire shows an advance of 180,575*l.*, its rateable value being 4,981,992*l.*; Durham of 149,686*l.*, its assessment being 2,502,139*l.*; Surrey of 146,891*l.*, its rateable value being 2,812,310*l.*, or less than Kent, which contributes on the value of 3,579,996*l.*, although its increase last year was represented by only 67,056*l.* The other counties which show the largest increases are:—Berks, 33,854*l.*; Chester, 37,286*l.*; Devon, 20,065*l.*; Essex, 68,222*l.*; Gloucester, 33,472*l.*; Herts, 27,358*l.*; Leicester, 27,153*l.*; Northumberland, 58,250; Stafford, 33,738*l.*; and Sussex, 46,093*l.*

9.—Emigration.

Fifteen Years' Emigration.—Very nearly seven millions of emigrants left the United kingdom in the fifty-five years from 1815 to the end of 1869. The crowds forming the exodus fluctuated greatly in successive years, but, on the whole, has been gradually on the increase, as will be seen from the following table, showing the total number of emigrants from the United Kingdom in each of the fifteen years from 1855 to 1869:

Years.	Total.	Years.	Total.	Years.	Total.
1855	176,807	1860	128,469	1865	209,801
1856	176,554	1861	91,770	1866	204,882
1857	212,875	1862	121,214	1867	195,953
1858	113,972	1863	223,758	1868	196,325
1859	120,432	1864	208,900	1869	258,027

EMIGRATION IN 1869.—The work of the Emigration Commission during the year 1869 was exceedingly extensive, inasmuch as, with the exception of 1852—when the exodus, chiefly Irish, reached the enormous figure of 368,764—and the two succeeding years, the number was the largest that ever left the United Kingdom in a single year. According to the report of the Commissioners, 258,027 persons emigrated in 1869 from the United Kingdom, being a large increase over the preceding year, represented, not by Irish, but by English and Scotch Emigrants. Of the above total number, 203,001 went to the United States, 33,891 to British North America, 14,901 to Australia and New Zealand, and 6324 to various other places. Of the emigration to the United States 31·06 per cent. were English, 32·75 Irish, 25·29 foreigners, whereas 2·42 per cent. were not specially distinguished. The Irish emigration in 1869, though absolutely larger than in 1868, bore a less proportion to the whole British emigration than in that year, for in 1868 it formed 47 per cent. of the British emigration, but in 1869 only 39⅓ per cent. Foreign emigration increased considerably in 1869, this class of emigrants sailing almost exclusively from Liverpool and Glasgow, to which ports they were conveyed from the German and northern ports by way of Hull. The Commissioners remark that "so long as the Continent is healthy, there can be no objection on general grounds to this emigration, while it is very beneficial to the ship-owners; but when epidemics prevail in the countries from which the emigrants are brought there is risk of the introduction of sickness through their means." It may be recollected that the cholera first made its appearance in this class in the year 1865. Among the English emigrants of 1869, were 1704 persons sent to Canada, in the spring, in the Royal Navy troopships, *Crocodile*, *Simoom*, and *Serapis*, most of these being labourers and artisans discharged from the Dockyards and Arsenal at Woolwich, with their families, to whom, as the transports were going out empty, the Board of Admiralty gave free passages on condition that the cost of their provisions on the voyage, with the emigrant tax on arrival, and a small sum as landing money, were provided from other sources. It was estimated that 2*l.* 5*s.* would be required for each adult, which sum was found principally by the British and Colonial Emigration Society. Of the whole number who emigrated to North America in 1869, amounting to 236,892, no less than 225,685, or 95·27 per cent., went in steamers, and only 11,207, or 4·73 per cent., in sailing vessels. The advance in this direction has, indeed, as regards America, been uninterruptedly progressive. The advantages which emigrants obtain by passages in steamboats cannot be exaggerated, though the cost is from 30 to 50 per cent. higher than in sailing ships. The mortality in steamships appears to be very small, inasmuch as during the year 1869 it was ·05 per cent., which, on the assumption that the voyage occupied 14 days, would be equal to a mortality of 14 per 1000 per annum. The number of alien emigrants who arrived in New York during the year 1869 was 258,989, of whom 99,605 were Germans, 66,204 Irish, 41,090 English, 23,453 Swedes, 10,643 Scotch, and 17,994 of other countries. There is an emigrant tax in New York of 2 dols. 50 cents a head, which is not only sufficient to defray all the expenses of a large depôt, but to leave a surplus, out of which a hospital has been founded, and other large buildings are about to be erected. In August 1869 the Commissioners received information that emigration was in progress from the United Kingdom to Venezuela, the emigrants proceeding to Hamburg, and there embarking on board a Prussian vessel. As it appeared that these emigrants had been grossly imposed upon, both as to the value of the land and the sanitary condition of the country, an official notice was issued, both as regards emigration to Venezuela and Buenos Ayres, which appears to have had the desired effect of warning persons against such enterprises. During the year 1869 there were seven prosecutions for various breaches of the Passenger Acts, and sums amounting altogether to 4007*l.* were recovered for emigrants by the emigration officers without resort to legal proceedings. In discussing the subject of assisted emigration by the Government the Commissioners show that, as regards North America, 3,112,144 British born statute adults emigrated between 1847 and 1869, and that their passages cannot have cost less than 15 millions sterling, or an average of upwards of 650,000*l.* a year. The whole of this sum was provided out of private resources, and in a great measure out of the remittances, from the United States and Canada, made by previous emigrants. Government emigration appears to be regarded with jealousy by both the Dominion of Canada and by the United States, for the former prohibit the landing of destitute emigrants until the amount necessary for their temporary support, and for conveying them to their destination, is paid by the master of the ship in which they arrive, and the latter, in a proposed bill lately framed, expressly exclude certain classes of emigrants. The report indicates that the actual demand for emigrants in the Australasian colonies is small. A request was made in 1869 from Western Canada for 25,000 emigrants, and less than 14,000 arrived. The wages for labourers for the whole year may be taken at about one dollar a day, as when agricultural operations are suspended in winter they are employed in woodcutting, thrashing, and similar work. The Commissioners deprecate all ambitious schemes of colonization, many of which indicate the sending out of emigrants at the expense of the Government, chiefly on the ground that, as all the wild land is covered with forest, means must be provided for all colonists to live for at least 12 or 18 months. During the 10 years, 1860-69, the mortality among emigrants sent out by the Commissioners was but ·82 per cent., and of 1088 ships despatched but five were lost, in one instance only with loss of life.

CHRONICLE OF EVENTS AND OCCURRENCES,

HOME AND FOREIGN.

From November 1869 *to November* 1870.

1869.

Nov. 12. Funeral of George Peabody, American philanthropist, at Westminster Abbey.
14. Fatal colliery explosion at Platt Bridge, near Wigan, Lancashire.
15. Arrival of the King of the Belgians in England.
17. Inauguration of the Great Suez Canal by an international fleet of steamers.
22. Elections to the Legislative Body in Paris, and return of four republican candidates.
29. Opening of the French Legislative Body by the Emperor Napoleon.
30. Riots in several parts of Spain.

Dec. 4. Motion for withdrawing from the Commercial Treaty, concluded with Great Britain in 1860, made in the French Legislative Body.
8. Opening of the Œcumenical Council, attended by upwards of 800 dignitaries of the Roman Catholic Church, at Rome.
11. Departure of a Russian expeditionary force of 1500 men to attempt the discovery of means for connecting the Caspian and Aral seas, from Astrakhan.
18. Bombardment of Port-au-Prince, Hayti, by the forces of General Saget, rival president.
21. Verdict of "Not guilty" delivered in the Court of Queen's Bench in the trial of "The Queen v. Gurney and Others."
22. Landing of the Duke of Edinburgh at Calcutta.
23. Submission of the leaders of the Dalmatian Insurrection.
27. Panic of fire at Bristol Theatre, with loss of twenty lives.
28. Destruction by earthquake, at 5 A.M., of the town of Santa Maura, Ionian Islands.
30. Refusal of the Red River insurgents to receive the governor sent from Canada.

1870.

Jan. 3. Installation by the Emperor Napoleon of a new ministry, under the presidency of M. Emile Ollivier.
7. Arrival of Sir Samuel Baker at Kartoum, to proceed at the head of an expedition of 1000 Egyptian soldiers into the interior of Africa.
8. Violent and destructive gale in London.
10. Assassination of Victor Noir, journalist, by Prince Pierre Bonaparte, at Auteuil, near Paris.
12. Destruction by fire of the old Star and Garter Hotel, Richmond.
15. Trial and execution of General Salnave, president of Hayti.
19. Strike of 10,000 workmen at the mines and factories of Creuzot, France.
21. Colliers' riots at Thorncliffe, near Sheffield.
22. Departure of the last detachment of British troops from New Zealand.
23. Panic at St. Joseph's R. C. Chapel, Liverpool, with loss of sixteen lives.
24. Collision between the United States war steamer *Oneida* and the Peninsular and Oriental Company's steamer *Bombay*, near Yokohama, Japan. "The *Oneida* was cut down on the

quarter, and sank with 115 men; two of her boats with 61 men escaped.

Jan. 28. Payment of £5,715,048, made by the Government to six telegraph companies, under Act 32 & 33 Vict. c. 73 (Aug. 9, 1869).

28. Sailing of the mail steamer *City of Boston*, of the Inman line, from Halifax, Nova Scotia, for Liverpool. "Disappeared without leaving a trace behind."

29. Obsequies of George Peabody at Portland, United States. "The remains were landed and borne by ten British soldiers to the funeral car, the band of the ironclad, *Monarch*, playing a dirge."

Feb. 1. Insurrection in Mexico, directed against the government of President Juarez.

7. Fatal riots, and throwing-up of barricades, at Paris.

8. Opening of the second session of the twentieth Parliament of Queen Victoria, by royal commission.

15. First reading of the Irish Land Bill in the House of Commons; Mr. Gladstone, on bringing in the measure, expressing a hope that it will lead "to unite Ireland to England and Scotland by the ties of free will and free affection."

17. First reading of a bill "to provide for public elementary education in England and Wales," in the House of Commons.

17. Severe earthquake at San Francisco, California.

19. Vote of the inhabitants of San Domingo for annexation of the republic to that of the United States.

22. Wreck of the steamer *Golden City*, bound from San Francisco for Panama, off the Mexican coast.

26. Admission into the Senate of the United States, by a vote of forty-eight against eight, of a "coloured senator" from Mississippi. "The first negro who ever sat in Congress, elected as successor of Jefferson Davis."

March 1. Battle of Aquidaban, and defeat and death of Lopez, president of Paraguay. "His career, both in its course and termination, resembled that of King Theodore of Abyssinia."

3. Renewed rioting at Paris.

5. Completion of the railway between Bombay and Calcutta. "The ceremony of keying the last rail was performed by the Duke of Edinburgh."

9. Fearful hurricane, causing great damage and loss of life, at Buenos Ayres.

12. Second reading of the Irish Land Bill voted in the House of Commons by 442 ayes against 11 noes.

12. Duel, near Madrid, between the Duke of Montpensier and the Infante Enrique de Bourbon. "The latter received a pistol ball in his head, and was killed on the spot."

15. Insurrectionary movements in various parts of Spain.

17. First reading in the House of Commons of a Bill "for the more effectual maintenance of life, and preservation of peace in Ireland."

17. Collision, near the Isle of Wight, between the *Normandy*, Channel mail steamer, and a merchant screw steamer, the former sinking, with loss of thirty-two lives.

18. Bill for establishing a High Court of Justice, and a Court of Appellate Jurisdiction, read a second time in the House of Lords.

18. Second reading of the Education Bill agreed to in the House of Commons without a division.

22. Second reading of the Bill for the preservation of peace in Ireland voted in the House of Commons by 425 ayes against 13 noes.

March 23. Completed laying, by the *Great Eastern* steamer, of a telegraph cable, connecting Bombay, Aden, and Suez.
24. Destruction by fire of the Alexandra Theatre, Glasgow.
25. Insurrectionary movements in various towns of Central Italy.
26. Hurricane at New York, overthrowing houses, with fatal results.
27. Prince Pierre Bonaparte acquitted by the Imperial High Court at Tours of the murder of Victor Noir.

April 2. Fresh earthquake at San Francisco; "the duration was six seconds, and the direction from south-east to north-west."
5. Great strike of ironworkers in the south of France.
9. Colliery accident, with loss of seven lives, at Bathgate, near Edinburgh.
9. Fatal conflagration at Cardiff; four persons burnt to death.
11. Capture of the secretary of the British Legation, and four other gentlemen, by brigands, at Marathon, near Athens.
11. Huge earthquake in Thibet. "The first shock was at 5 A.M., and at sunset the town of Bathang was shaken from end to end, and nearly all the houses, large and small, fell to the ground, burying half the population, or more, in the ruins. Arsenals, magazines, the large Lamaserai, tenanted by 3000 Lamas, all went at once into a vast grave. Then a furious wind sprang up, and a fire broke out in Bathang, which continued till the 23rd, burning up the living and the dead, and everything else that the earthquake had spared. 413 Lama priests, 19 Chinese soldiers, 38 Thibetan soldiers, all the Thibetan officials, and 2812 other people were destroyed."
12. Assassination of General Urquiza, governor of the province of Entre Rios, Argentine Confederation.
17. Hurricane at Lisbon, with great destruction of shipping on the river Tagus.
21. Murder by Greek brigands of the British secretary of Legation and two other prisoners, captured ten days previously.
23. Issue by the Emperor Napoleon of a decree summoning the French nation to a "plébiscite" on Sunday, the 8th of May.
27. Fall of a floor in the state capitol of Richmond, Virginia. "When the maimed, the dying, and the dead, were taken out from the mass of bricks and beams, it was found that 59 persons had been killed, and about 150 more or less severely injured."
29. Plot against the life of the Emperor Napoleon discovered by the French police.

May 6. Collision between the steamers *Earl of Elgin* and *Jesmond*, off the Yorkshire coast, the former sinking, with loss of eight lives.
7. Murder of Prince D'Arenberg, military attaché of the Austrian embassy, at St. Petersburg.
8. National vote throughout France of the Imperial plébiscite. "The people approve the liberal reforms effected in the Constitution since 1860 by the Emperor, with the co-operation of the great bodies of the state, and ratify the Senatus Consultum of the 20th of April, 1870." It is adopted by 7,138,367 against 1,518,385 votes.
8. Republican insurrection at Catanzaro, Italy.
9. Riots in Paris, suppressed by the troops.
10. Total wreck, with loss of entire crew except nine, of Her Majesty's gunboat *Slaney*, on the Paracel Islands, Indian Ocean.
11. Destruction of the town of Oaxaca, Mexico, by earthquake. "The movement at first was oscillating from south to north, and almost instantaneously followed by a vertical shock."

May 11. Opening of the new buildings of London University by the Queen.
14. Opening of the new hall of the Inner Temple, London, by Princess Louise.
14. Close of the University of Naples, in consequence of political disturbances.
16. Reconstruction of the Cabinet of the Emperor Napoleon.
19. Revolt of the garrison of Lisbon, led by Marshal Saldanha; the royal palace invaded, and the king forced to nominate a new ministry, presided over by the marshal.
21. Launch of the *Sultan*, ironclad ship of new construction, at Chatham.
24. Great conflagration at Quebec, rendering 6000 persons homeless.
25. Invasion of Canada by a Fenian band of 2000, headed by "General" O'Neill. "The 'general' was arrested at the head of his troops by the United States marshal, and then the war was over. The Fenians were 90 minutes on Canadian soil."
26. Boiler explosion, with loss of fourteen lives, at Kidsgrove, Staffordshire.
29. Massacre of Jews at Botuschany, Roumania. "Letters from the place describe the fury of the populace as horrible."

June 4. Destruction of part of the city of Panama, Central America, by fire.
5. Immense conflagration at Constantinople; 20,000 houses burnt in the suburb of Pera, and above 1000 lives lost.
6. Fatal boat accident at Hastings, with loss of seven lives.
9. Bursting of a cyclone over Calcutta and the Bay of Bengal; "it kept raging for sixteen hours."
16. Explosion at the Royal Gunpowder Mills, Waltham Abbey, with loss of five lives.
21. Railway disaster at Newark, on the Great Northern Railway; twenty persons killed.
21. Massacre of French residents by the populace at Tien-tsin, China.
25. Abdication, signed at Paris, of Queen Isabella II., ex-Queen of Spain.
30. Earthquake in the island of Santorin, Greek Archipelago; "the chief town is a mass of ruins, and several small islets near are submerged."

July 1. Foundation stone of a new Grammar School, at Reading, laid by the Prince of Wales.
2. Destruction of the town of Oroville, California, by fire.
3. Decision of the Spanish cabinet to adopt Prince Leopold of Hohenzollern as candidate for the throne.
6. Declaration of the French Minister of Foreign Affairs, in the Legislative Body, that his government will not permit the candidature of Prince Leopold.
11. Withdrawal, in consequence of representations made by the French Ambassador to the King of Prussia, of the assent given by Prince Leopold of Hohenzollern to accept, if elected by the Cortes, the crown of Spain.
13. Opening of the northern Thames Embankment by the Prince of Wales.
15. Declaration of the President of the Council of Ministers in the French Legislative Body, that the government is resolved to go to war with Prussia, "to guard the interests, the security, and the honour of France."
18. Fourth Public Session or the Œcumenical Council at Rome, and vote of the dogma of Infallibility of the Pope, by 450 ayes against 88 noes.

July 19. Formal declaration of war delivered by the French chargé d'affaires at Berlin to the Prussian Government.
19. Suicide of M. Prévost-Paradol, envoy of the Emperor Napoleon to the United States.
21. Rate of discount at the Bank of England raised from 3 per cent., at which it was fixed November 4, 1869, to 3½ per cent.
23. Decree for the appointment of the Empress Eugénie as Regent of France, during the absence of the Emperor with the army.
23. Bank rate of discount raised from 3½ to 4 per cent.
24. Departure of the French iron-clad fleet from Cherbourg.
26. Union of the troops and reserves of the South German States with those of the North German Confederation. "It is not an army, but a nation in arms, that is rolling forward like an irresistible tide."
28. Proclamation issued by the Emperor Napoleon, on joining the French troops at Metz: "The God of armies will be with us."
28. Rate of discount at the Bank of England raised from 4 to 5 per cent.
31. Proclamation issued by the King of Prussia, on leaving Berlin for the seat of war: "With full trust in God we accept the battle."

Aug. 1. Royal assent given to the Irish Land Bill.
1. Supplementary grant of 2,000,000*l.*, "towards defraying the expenses which may be incurred in maintaining the naval and military services of the kingdom during the war in Europe," passed by the House of Commons.
2. Attack upon Saarbrück by a French force under the Emperor Napoleon, who telegraphs to the Empress: "Louis has received the baptism of fire."
4. Storming of Weissenburg by the Crown Prince of Prussia; General Abel Douay killed, and 1000 prisoners taken.
4. Rate of discount at the Bank of England raised from 5 to 6 per cent.
5. Riots at Paris.
6. Defeat of the army of General MacMahon by the Crown Prince of Prussia at Woerth; loss by the French of 6000 men, 30 pieces of artillery, 6 mitrailleuses, and 2 eagles.
6. Defeat of the army of General Frossard by the Germans, at Forbach, near Saarbrück.
7. Telegram from the Emperor Napoleon to the Empress: "All may yet go well" (*Tout peut se rétablir*).
7. Convocation of the French Chambers; Paris declared in a state of siege.
8. Concentration at Metz of the French "Army of the Rhine."
9. Meeting of the French Chambers, and resignation of the Ollivier ministry.
9. Treaty for the neutrality of Belgium signed in London, between the representatives of Great Britain and Prussia, the French Government giving its verbal adherence.
10. Formation of a new government under Count Palikao, at Paris.
10. Prorogation of Parliament, by royal commission, until the 27th of October.
11. Votes granting 1,000,000,000 francs for war purposes, and establishing a forced currency for bank notes, passed by the French Chambers.
11. Proclamation of King Wilhelm of Prussia to the French: "The Emperor Napoleon having made, by land and by sea, an attack on the German nation, which desired and still desires to live in peace with the French people, I have assumed the command of the German armies to repel this aggression."

Aug. 11. Rate of discount at the Bank of England lowered from 6 to 5½ per cent.
12. Surrender of Nancy, capital of Lorraine, to the Germans. "The city was taken possession of at two o'clock in the afternoon, by four Uhlans."
14. Battle of Courcelles: interception and defeat of the French army in the attempt to retreat from Metz to Verdun.
16. Battle of Vionville: repulse of the main forces of Marshal Bazaine by the German armies.
18. Battle of Gravelotte: decisive victory of the Germans over Marshal Bazaine, and shutting-up of his army within the walls of Metz. Capture of 3000 French prisoners and 30 pieces of artillery.
18. Rate of discount at the Bank of England lowered from 5½ to 4½ per cent.
19. Fatal colliery explosion at Bryan Hall, near Wigan; twenty-two persons killed.
20. Retreat of the army of Marshal MacMahon from the camp of Châlons.
21. Entry of Marshal MacMahon at Rheims.
21. Decree of the French Government ordering the issue of a national loan of 750,000,000 francs.
23. Concentration of a German force of 100,000 men, under the Crown Prince of Saxony, in the Ardennes.
24. Decree of General Trochu, governor of Paris, expelling from the town all foreigners and "useless mouths" (*bouches inutiles*).
24. Arrival of Marshal MacMahon's army at Rethel, on the way to Montmédy.
25. Capitulation of the fortress of Vitry to the Germans.
25. Bombardment of Strasburg commenced.
25. Rate of discount of the Bank of England lowered from 4½ to 4 per cent.
26. Attempt of Marshal Bazaine to break out of Metz defeated with severe loss.
28. Encampment of Marshal MacMahon's army at Vaux, between Mouzon and Carignan.
29. Defeat of General De Failly, commanding a portion of Marshal MacMahon's army, near Montmédy, with loss of 4000 prisoners.
30. Defeat of Marshal MacMahon at Beaumont; 10,000 prisoners and 25 pieces of artillery taken by the Germans.
31. Defeat of Marshal MacMahon at Douzy and Bazeilles, and retreat of his army to Sedan.

Sept. 1. Battle of Sedan, ending in a full rout of the French army.
1. Rate of discount at the Bank of England lowered from 4 to 3½ per cent.
2. Capitulation of Sedan, the Emperor Napoleon, and the whole of Marshal MacMahon's army, numbering 100,000 men, being made prisoners of war.
3. Night meeting of the French Chambers; proposal of the Left to establish a Provisional Government.
4. Proclamation of the Republic at Paris, and formation of a "Government of National Defence," presided over by General Trochu and M. Jules Favre. "At three o'clock in the afternoon the Empress-Regent fled from the Tuileries, and the Imperial flag over the palace was immediately after pulled down. There is indescribable joy in Paris."
5. Entry of the King of Prussia into Rheims.
6. Decree of the French Government of National Defence ordering the nation under arms, to resist the advance of the German armies upon Paris.

Sept. 7. Loss of the ironclad turret-ship *Captain* off Cape Finisterre. Admiral Sir Alexander Milne, on board the *Lord Warden*, reports: "The *Captain* was close to this ship at two in the morning. Then there was a sudden south-west gale, with heavy squalls; at daybreak the *Captain* was missing."

8. Decree of the French Government of National Defence, summoning the electoral colleges for the 16th of October, to elect a National and Constituent Assembly.

9. Surrender of the town of Laon to the Germans, followed by the blowing-up of the citadel, by which 300 men were killed.

11. Occupation of Château-Thierry by the main body of the German armies.

13. Occupation of Meaux by the Germans.

14. Fatal accident to the Irish Mail train, near Tamworth, on the London and North Western Railway.

15. Rate of discount at the Bank of England lowered from 3½ to 3 per cent.

17. Entry of an Italian army, under General Cadorna, into the Pontifical States.

18. Occupation of Versailles by the vanguard of the German army.

19. Rout of General Vinoy, commanding an army of 25,000 men, at Villejuif, near Paris, with loss of 2500 prisoners and seven guns.

20. Complete investment of Paris by the German armies; a delegation of the Government of National Defence installed at Tours.

20. Occupation of Rome by Italian troops.

22. Interview between M. Jules Favre, Vice-President of the Government of National Defence, and Count von Bismarck, at Ferrières, near Paris.

23. Departure of the French fleet from the Baltic.

24. Capture of the fortress of Toul by the Germans.

26. Defeat of a French force at Melun.

28. Capitulation of Strasburg. "The city was taken, in profound peace, from the Germanic Empire on the 28th of October, 1681, exactly 189 years before."

29. Rate of discount at the Bank of England lowered from 3 to 2½ per cent.

30. Official report of the Prussian Government that there are, at this date, 127,277 unwounded French prisoners in Germany, the number comprising 3577 officers, and 123,700 men.

Oct. 1. Decree of the Government of National Defence at Paris, adjourning *sine die* the elections for a National and Constituent Assembly, fixed to take place on the 16th of October.

1. Defeat of General Reyan, commanding 20,000 newly-formed troops of the Garde Mobile, at Toury, near Orleans.

2. Plébiscite in the Roman States to declare for or against annexation to the Kingdom of Italy: 133,681 votes given "Yes," and 1,507 votes "No."

3. Riots at Lyons, provoked by the Socialist-Republican party.

5. Defeat of a body of irregular French troops at St. Quentin.

6. Establishment of the head-quarters of the King of Prussia at Versailles.

6. Defeat of General Dupré, commanding a force of 30,000 troops of the line and Garde Mobile, at St. Remy, in the Vosges.

7. Flight of M. Léon Gambetta, member of the Government of National Defence, in a balloon, from Paris to Amiens.

7. Attempt of Marshal Bazaine to break out of Metz repulsed after a desperate encounter, with a loss of 10,000 men on both sides.

Oct. 9. Proclamation of the King of Italy, declaring that Rome and the Pontifical States form an integral part of the Kingdom of Italy.
10. Defeat at Arthenay, near Orleans, of the first division of the newly-formed "Army of the Loire," under General Lamotte Rouge.
11. Occupation of Orleans by a German army of 20,000 men, under General Von der Tann.
12. General Garibaldi appointed Commander-in-Chief of the irregular forces of Eastern France, by the Government of National Defence, at Tours.
12. Capture of the town of Epinal by the Germans.
13. Firing of the Palace of St. Cloud by the guns of Mont Valérien, Paris.
14. Reappearance of the French fleet off Heligoland.
16. Capture of the fortress of Soissons, after four days' bombardment.
18. Surrender of the town of Vesoul to the Germans.
19. Wreck of the steamer *Cambria*, from New York to Glasgow, on the coast of Derry, Ireland, with loss of the whole crew and all passengers except one.
20. Shock of earthquake throughout Canada and the north-eastern part of the United States. "The vibratory motion, occurring at 11·30 A.M., lasted for twenty-five seconds."
21. Surrender of the city of Chartres to the Germans.
21. Publication of a Pontifical Bull at Rome, announcing the suspension of the Œcumenical Council, "in consequence of the sacrilegious invasion of Rome, which infringes upon the liberty of the Holy Father and the Bishops."
22. Proposition for an armistice addressed by the British Government to the French and German belligerents.
24. Capture of the fortress of Schlestadt, after three days' bombardment.
25. Announcement in the *London Gazette* that Her Majesty's consent has been given "to a contract of matrimony between Her Royal Highness the Princess Louise Caroline Alberta and John George Edward Henry Douglas Sutherland Campbell, commonly called the Marquis of Lorne."
25. Prorogation of Parliament to the 13th of December.
28. Capitulation of the fortress of Metz to the Germans, with surrender of three marshals of France, 50 generals, 6,000 officers, and 173,000 soldiers.
29. Occupation of Dijon, after an hour's bombardment.
31. Insurrection at Paris, and temporary arrest of the members of the Government of National Defence.
31. Official report of the Prussian government that there are, at this date, above 333,000 French prisoners in Germany, the number comprising 10,000 officers, and 323,000 men.

Nov. 1. Negotiations for an armistice between M. Thiers, representative of the French Government of National Defence, and Count Bismarck, Chancellor of the North German Confederation, at Versailles.
3. Vote of confidence of the citizens of Paris in the Government of National Defence; 557,976 ayes against 62,638 noes.
4. Prince Amadeo, youngest son of the King of Italy, proposed to the Cortes for election as King of Spain.
6. Rupture of the negotiation for an armistice carried on at Versailles, and recall of M. Thiers by the Government of National Defence at Paris.

NECROLOGICAL TABLE

OF DISTINGUISHED AND NOTABLE MEN WHO DIED 1869–70.

1869.		Age.
Nov.	6. STEWART, Charles, Rear-Admiral, senior flag officer of the United States navy; at Bordentown, New Jersey . .	92
	11. HARNESS, Rev. William, author of 'Christian Education,' and other works; at Kensington, London . . .	80
	12. KENDALL, Amos, American statesman, formerly Post-master-General of the United States; at Washington .	80
	15. DONKIN, William Fishbourne, Savilian Professor of Astronomy at the University of Oxford; at Oxford . .	59
	21. FITZPATRICK, Benjamin, American statesman, for some time Governor of Alabama; at Montgomery, Alabama.	70
	22. EVANS, Rev. William Edward, canon of Hereford, author of 'Songs of the Birds;' at Hertford	68
	25. GRISI, Madame Giulia, Italian operatic singer; at Berlin.	57
Dec.	12. BRYSON, Dr. Alexander, formerly director-general of the medical department of the navy; at Barnes, Surrey .	67
	13. LADOUCETTE, Louis Napoléon, French statesman, member of the French Senate since 1852; at Paris . . .	60
	18. PENDINI, Francesco, Roman prelate, cardinal-deacon of the Pontifical see; at Rome	71
	21. DELANGLE, Claude Alphonse, French statesman, Minister of Justice 1859–63; at Paris	72
	23. REISACH, Karl von, Roman prelate, cardinal-bishop of the Pontifical see; at Annecy, Savoy	70
	— STANTON, Edwin, American statesman, Secretary of War of the United States 1862–67; at Washington. . .	55
	24. LEE, Right Rev. James Prince, Bishop of Manchester 1848–69; at Mandleth Hall, near Manchester. . .	65
	27. BOURQUENEY, Baron François, French diplomatist, ambassador at Constantinople 1844–55; at Paris . . .	70
	31. LEFÉBURE-WELY, Louis, French musical composer, author of 'Les Recruteurs,' and other operas; at Paris . .	52
1870.		
Jan.	9. EVANS, Sir De Lacy, General, commander of a division of the British army in the Crimean war; in London .	82
	— AINSLIE, Rev. Gilbert, master of Pembroke College, Cambridge 1828–70; at Pembroke Lodge, Cambridge .	76
	10. PRATT, John Tidd, Registrar of Friendly Societies; at Abingdon Street, London	72
	18. WILLIAMS, Rev. Rowland, author of 'Review of Bunsen;' at Broadchalke Vicarage, near Salisbury . . .	53
	20. SEYMOUR, Sir George Francis, Admiral of the Fleet; in London	84
	21. HERZEN, Alexander, Russian journalist, editor of the 'Kolokol;' at Paris	53
	22. PONGERVILLE, Sanson de, French poet, member of the Académie Française; at Paris.	78
	24. BROGLIE, Achille Victor, Duke of, French statesman and author, minister of Foreign Affairs 1832–36; at Paris .	84
	25. DARLING, Sir Charles Henry, governor of Victoria 1863–66; at Cheltenham, Gloucestershire	61
	26. DENISON, Edward, lawyer and politician, M.P. for Newark 1868–70; at Melbourne, Australia	30
Feb.	1. REGNAULT DE SAINT-JEAN-D'ANGELY, Count Auguste, French field marshal; at Cannes	76

		Age.
Feb.	2. NYON, Eugène, French dramatist, author of 'La rose de Provins;' at Paris	60
	6. GORDON, Sir William, lieutenant-colonel, artillery officer; at Westward-Ho, Devonshire	65
	7. WINDHAM, Sir Charles Ashe, lieutenant-general, commander of a brigade in the Crimean war; in London	60
	14. HARPER, Joseph Wesley, American publisher, one of the founders of the house of Harper Brothers; at New York	69
	17. ANDERSON, Alexander, American artist, first engraver on wood in the United States; at Boston	95
	19. ROTHSCHILD, Baron Nathaniel de, French banker, one of the partners in the House of Rothschild; at Paris	58
	21. GILBERT, Right Rev. Ashurst Turner, Bishop of Chichester 1842-70; at the Palace, Chichester	83
	23. BURLINGAME, Anson, American diplomatist, ambassador of China to the United States and Europe; at St. Petersburg	48
	25. HERTZ, Henrik, Danish poet and dramatist, author of 'Kong René's Datter;' at Copenhagen	71
	26. BONALD, Louis de, Archbishop of Lyons, cardinal priest of the Pontifical see; at Lyons	81
	— HOGARTH, George, musical critic, author of 'Memoirs of the Opera;' in London	87
	28. HATCHARD, Right Rev. Thomas Goodwin, Bishop of Mauritius 1869-70; at St. Catherine, Mauritius	53
March	1. LOPEZ, Don Francisco Solano, President of the Republic of Paraguay 1862-70; at Aquibana, Paraguay	43
	2. MALTITZ, Apollonius Von, German poet and dramatist, author of 'Singedichte,' and other works; at Weimar	75
	4. MARKBY, Rev. Thomas, author, Secretary to the Syndicate for conducting Local Examinations; at Cambridge	37
	7. ADDINGTON, Right Hon. Henry Unwin, diplomatist, for more than half a century in the Foreign Office; in London	80
	10. BERKELEY, Francis Henry, M.P. for Bristol 1837-70; at Cheltenham	75
	13. MONTALEMBERT, Charles Forbes de Tyron, Count of, French statesman, author, and journalist; at Paris	60
	15. RIANCEY, Henri de, French journalist, author of 'Histoire du monde;' at Paris	54
	16. HERTSLET, Lewis, historical writer, author of 'Hertslet's Treaties;' at Great College Street, Westminster	84
	20. RODEN, Robert Judge, Earl of, formerly Auditor-General in Ireland; at Tollymore Park	82
	23. WODEHOUSE, Rev. Charles Nourse, Canon of Norwich 1817-60: at Lynn Regis, Norfolk	80
	26. GREEN, Charles, aëronaut; at Tufnell Park Road, London	84
	27. MONVOISIN, Raymond, French painter, author of 'Bataille de Denain,' and other pictures; at Boulogne	77
	28. SOULÉ, Pierre, American statesman, ambassador of the United States at Madrid 1853-55; at New York	71
	— THOMAS, George Henry, American general, commander of the army of the Cumberland during the Civil War; at San Francisco	54
	29. RAU, Karl Heinrich, German political economist, professor at Heidelberg 1822-70, author of 'Lehrbuch der Politischen Oekonomie;' at Heidelberg	78
	30. NEUMANN, Karl Friedrich, German philologist, author of 'Geschichte des Chinesischen Reiches;' at Berlin	71
	31. GREY, Hon. Charles, General, equerry to the Queen since 1837, and private secretary since 1861; at St. James's Palace, London	66

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April	4. MAGNUS, Heinrich Gustav, German chemist, professor at the University of Berlin; at Berlin	68
	9. BERIOT, Charles Auguste de, Belgian violin player and composer; at Brussels	68
	11. LUTZE, Arthur, German poet and physician, author of 'Lehrbuch der Homöopathie;' at Köthen, Anhalt . .	57
	13. HESS, Baron Heinrich von, Austrian field-marshal, commander-in-chief of the Italian army, 1859; at Vienna .	82
	14. MÜNDLER, Otto, German art critic, late travelling agent to the National Gallery, Trafalgar Square; at Paris . .	59
	15. BLACKBURN, Rev. John, author of 'Transactions of the Royal Society;' at Yarmouth, Isle of Wight . . .	82
	19. FANE, Hon. Julian, diplomatist and lyrical writer, author of 'Poems;' at Portman Square, London	43
	20. HAVERGAL, Rev. William Henry, Prebendary of Worcester, author of works on music; at Leamington . .	78
	21. HERBERT, Edward Henry Charles, Secretary of Legation at Athens; near Athens	33
	22. COSTELLO, Louisa Stuart, novelist, author of 'Pilgrimage to Auvergne,' and other works; at Boulogne, France .	56
	25. AUCKLAND, Right Rev. Robert John, Baron, Bishop of Bath and Wells 1854–69; at Wells	71
	23. MACLISE, Daniel, historical and portrait painter, designer of frescoes in Westminster Palace; at Chelsea, London	59
	26. ROQUEPLAN, Nestor, French journalist, director of the Paris opera 1847–54; at Paris	67
	27. MARIE, Alexander Thomas, French lawyer and member of the Provisional Government of 1848; at Paris . .	73
	29. DEMIDOW, Prince Anatoli, Russian art critic, author of 'Voyage dans la Russie méridionale;' at Paris . .	57
	30. MACKINNON, William Alexander, author of 'History of Civilisation;' at Broadstairs, Kent	81
May	5. ANTROBUS, Sir Edward, banker, senior partner in the house of Coutts; at Lower Cheam, Surrey . . .	78
	6. SIMPSON, Sir James Young, discoverer of the anæsthetic properties of ether and chloroform; at Edinburgh .	59
	7. M'COMBIE, William, editor of the 'Aberdeen Free Press;' at Dundee	61
	10. VILLEMAIN, Abel François, French author, Permanent Secretary of the Académie Française; at Paris . .	80
	11. WALDECK, Benedict Leo, German statesman, Councillor of the Supreme Court of Prussia; at Berlin. . . .	68
	14. DALE, Rev. Thomas, Dean of Rochester, and formerly Canon of St. Paul's; at Rochester	72
	17. HILL, David Octavius, landscape painter; at Edinburgh	68
	18. M'QUEEN, James, proprietor and for some time editor of the 'Glasgow Courier;' at Glasgow	93
	23. LEMON, Mark, dramatic author, editor of 'Punch;' at Crawley, Sussex	60
	24. VIVIAN, John Ennis, M.P. for Truro, Cornwall, for 22 years; at Truro	83
	28. REDDING, Cyrus, poet and journalist, author of 'History of Wines;' at 10, Hill Road, St. John's Wood . .	85
June	1. GRANT, Right Rev. Thomas, titular Roman Catholic Bishop of Southwark; at Rome	60
	8. OLINDA, José, Marquis of, Brazilian statesman, Regent of the Empire 1837–40; at Rio de Janeiro	81
	9. DICKENS, Charles, author of 'Memoirs of the Pickwick Club,' and numerous other works of fiction; at Gadd's Hill, Kent	58

		Age.
June	17. BONAPARTE, Jerome Napoleon, American politician, eldest son of Jérome, King of Westphalia; at Baltimore, U.S.	65
	23. LÜNING, Jacob William, merchant, 'first undoubted centenarian;' at Morden College, Blackheath, Kent	103
	26. SYME, James, Professor of Clinical Surgery in the University of Edinburgh; at Millbank, Edinburgh	72
	27. CLARENDON, Frederick Villiers, Earl of, Secretary of Foreign Affairs; at 1, Grosvenor Crescent, London	70
	29. CLARK, Sir James, medical writer, first physician to H.M. Queen Victoria; at Bagshot, Surrey	82
July	4. MINTROP, Theodor, German painter, author of the 'Bergpredigt' and other altar pieces; at Düsseldorf	56
	8. KINGLAKE, John Alexander, Recorder of Bristol, and M.P. for Rochester; at Eaton Square, London	65
	9. YOUNG, Murdo, for many years editor of the 'Sun' newspaper; at Brighton	82
	12. DAHLGREN, John, American admiral, inventor of the "Dahlgren gun;" at Washington	50
	13. GIFFORD, Sir George Markham, Lord Justice of the Court of Appeal; at Prince's Gardens, Hyde Park, London	57
	18. THORPE, Benjamin, archæologist and antiquary; at Chiswick, near London	88
	19. PRÉVOST-PARADOL, Lucien, French journalist, ambassador to the United States; at Washington	41
	25. DUPONT, Pierre, French poet, author of 'Les Paysans,' 'Chants et Chansons,' and other works; at Lyons	49
	30. RIDDELL, Henry Scott, author of 'Scotland yet,' and other songs; at Teviot Head, Scotland	72
Aug.	6. DOUAY, Charles Abel, French general, commander of the 7th division of the "Army of the Rhine;" at Weissenburg	61
	8. THWAITES, Sir John, Chairman of the Metropolitan Board of Works; at Meaburn House, Putney, Surrey	56
	13. HATCHELL, Right Hon. John, for some time Attorney-General for Ireland; at Dublin	82
	14. FARRAGUT, David Glasgoe, American admiral; at Portsmouth, Hampshire, U.S.	70
	19. KLOTZ, Dr. Reinhold, German philologist, author of 'Handbuch der lat. Literaturgeschichte;' at Leipzig	63
	22. CRAIK, Rev. Dr. James, Moderator of the General Assembly of the Church of Scotland 1863; at Glasgow	68
	23. POLLOCK, Sir Frederick, Chief Baron of the Court of Exchequer from 1844 to 1866; at Hatton, Middlesex	87
	26. WOODFORD, Sir Alexander, field-marshal, Governor of Chelsea Hospital; at Chelsea Hospital	88
	27. WILLOUGHBY D'ERESBY, Lord Alberic Drummond, Hereditary Great Chamberlain of England; at Richmond	49
	30. TRAUTTMANSDORFF, Count Joseph Von, Austrian diplomatist; at Vienna	82
	31. LACORDAIRE, Jean Théodore, French anatomist and entomologist; at Liége, Belgium	60
Sept.	1. CORNEY, Bolton, essayist, author of 'New Curiosities of Literature;' at Greenwich	86
	2. FLAHAUT DE LA BILLARDERIE, Count Auguste de, French diplomatist and military commander; at Paris	85
	2. PEMBERTON, Lieut.-Colonel, special correspondent of the 'Times,' at the headquarters of the King of Prussia; near Sedan, France	39

		Age.
Sept.	5. SELFE, Henry Selfe, stipendiary magistrate of Westminster Police Court; at St. George's Square, London . .	59
	7. BURGOYNE, Captain Hugh Talbot, Commander of the iron-clad turret-ship *Captain*; drowned off Cape Finisterre.	48
	7. COLES, Captain Cowper Phipps, designer of the iron-clad turret-ship *Captain*; drowned off Cape Finisterre . .	51
	13. LEHMANN, Martin Orla, Danish statesman and journalist, Minister of State, 1848; at Copenhagen	60
	18. YOUNG, Sir Henry Edward Fox, Governor of Tasmania from 1841 to 1861; in London	62
	20. DUVAL, Jules, French journalist, author of 'Les Colonies et la Politique Coloniale de la France,' and other historical works; at Tours	57
	24. BRAITHWAITE, John, civil engineer, constructor of many lines of railways; in London	73
	26. RUSSELL, Rev. William, for 53 years rector of Shepperton, Middlesex; at Shepperton	80
	30. MILLER, William Allen, professor of chemistry at King's College, London, author of 'Elements of Chemistry,' and other works; at Liverpool	52
Oct.	2. MÉRIMÉE, Prosper, French journalist and historian, contributor to the 'Revue des Deux Mondes,' and the 'Constitutionnel;' at Cannes	67
	4. HANNINGTON, Rev. Henry, Senior Fellow of King's College, Cambridge; at South Kensington . . .	71
	6. MATTHIESSEN, Dr. Augustus, Professor of Chemistry at St. Bartholomew's Hospital, London; at St. Bartholomew's Hospital	53
	7. WAGNER, Rev. Henry Michell, for 46 years vicar of Brighton; at the vicarage, Brighton	85
	9. MATTEI, Mario, Roman Cardinal, Dean of the Sacred College of Cardinals; at the Vatican, Rome. . . .	78
	10. VANGEROW, Karl Adolf Von, German jurist, author of 'Lehrbuch der Pandekten;' at Heidelberg . . .	62
	12. LEE, Robert Edmund, Commander of the army of the Confederate States in the American Civil War; at Lexington, Virginia	63
	13. DEAN, Gilbert, American statesman, formerly Judge of the Supreme Court of the State of New York; at Poughkeepsie, New York	68
	14. TWESTEN, Karl, German lawyer and politician, member of the Prussian Parliament; at Berlin	50
	20. BALFE, Michael, musical composer, author of 'Satanella' and other operas; at Rowney Abbey, Herts . . .	62
	24. ONSLOW, Arthur George, Earl of, senior member of the House of Lords; at Richmond Hill, Surrey . . .	93
	25. TUXFORD, George Parker, journalist, proprietor of the 'Mark Lane Express;' at Barnes, Surrey . . .	63
	29. BAROCHE, Pierre Jules, French statesman, Minister of Justice and of Foreign Affairs under Napoleon III.; at St. Heliers, Jersey	68
	30. MARTIN, Charles Wykeham, M.P. for Newport, Isle of Wight, 1845–52, and since 1865; at Maidstone . .	69

NOTE.—The Necrological Table here given, contains the names of 137 distinguished men of all countries, who died during the twelve months from the commencement of November 1869 to the end of October 1870. Of this number, no less than thirty-six, or above 26 per cent., died at the age of 80 or more, while five were upwards of 90, and one —notable mainly on this account—reached the well-ascertained age of 103, the fact solving some expressed doubts as to the existence of "centenarians."

Fluctuations of the Funds and Bank Rate of Discount from April 1869 to October 1870.

	Consols.	Reduced 3 per Cent.	New 3 per Cent.	Bank Stock.	India 10½ per Cent.	India 5 per Cent.	India Debentures.
1869.							
April	93⅞	92⅜	92⅜	241	212½	115	104½
	92¾	91½	91½	238	210	112½	103¼
May	93⅞	92⅜	92⅜	246	213	115½	104½
	91¾	90½	90¼	239	210	114	102½
June	94¼	93	93	246	213	115	103½
	92	92	92	240	206	111⅜	102½
July	93⅜	93¼	93¼	245	212½	112	104
	92⅝	92⅝	92⅝	240	206	111½	103
August	93⅝	93⅞	93⅞	246	211	114	104
	92⅝	92¾	92¾	243	207	111½	103
September	93¼	93⅝	93⅝	246	212	114¾	104¼
	92½	91⅛	91⅛	238	209	113½	103
October	93⅝	92⅛	92⅛	240	212	115¼	104¼
	92¾	91⅜	91⅜	236	210	113⅞	103½
November	94⅛	92½	92½	240	213½	115⅜	104¼
	93	91½	91½	237	211	114¾	103½
December	93⅞	92¼	92¼	240	214	115	104¼
	91⅞	91¾	91¾	235	207	111½	103½
1870.							
January	92¾	92¾	92¾	239	209	112	104½
	92⅝	92	92	235	207	111⅝	103½
February	92¾	93⅛	93⅛	242	209	112	104¼
	92⅛	92⅜	92⅜	237½	207	111½	103¾
March	93½	93	93	242	209½	113⅜	104
	92½	91¼	91¼	236	207	111⅝	103¼
April	94¼	92¾	92¾	238	211	113⅞	104
	93¼	91¾	91¾	231	208	112⅞	103¼
May	94½	92⅞	92⅞	236	211	114¼	103¾
	93¾	92⅛	92⅛	233	209	113⅜	103
June	94⅜	92⅞	92⅞	236	211	114¾	103½
	92⅜	92⅜	92⅜	233	204	110¾	102¾
July	93⅛	93	93	235	206	111⅜	103½
	88¾	88⅞	88⅞	232	203	109	102½
August	92⅝	92	92	235	206	111½	103¼
	88¼	88¼	88¼	232	201	107	100½
September	92⅜	90	92⅜	236½	207	110⅜	103¼
	91½	90¼	90¼	234	203	109	101½
October	92¾	91½	91½	234	209	112¼	103½
	91⅞	90½	90½	232	205½	110⅛	103

On the 1st of April, 1869, the rate of discount at the Bank of England was raised from 3 per cent., at which it had been fixed on the third of December, 1868, to 4 per cent. On the 7th of May, 1869, the rate was raised from 4 to 4½ per cent.; on the 10th of June it was lowered to 4 per cent.; on the 24th of June to 3½ per cent.; on the 15th of July to 3 per cent., and on the 19th of August to 2½ per cent. On the 4th of November, 1869, the rate was raised from 2½ to 3 per cent., and remained thus till the 21st of July, 1870, when it was raised to 3½ per cent., followed by a rise to 4 per cent. on the 23rd of July, to 5 per cent. on the 28th of July, and to 6 per cent. on the 4th of August. On the 11th of August, 1870, the rate was lowered again to 5½ per cent., on the 18th of August to 4½ per cent., on the 25th of August to 4 per cent., on the 1st of September to 3½ per cent., on the 15th of September to 3 per cent., and on the 29th of September to 2½ per cent.

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